Mindfulness-Based Cognitive Therapy for Children: Is it feasible, acceptable, and effective, for prevention of internalizing difficulties in Australian primary school children?

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ABSTRACT

Anxiety and depression are common mental disorders, with onset of symptoms typically during childhood. Prevention and early intervention programs for children are available, but little is known about efficacy compared to active controls, or duration of effects. Mindfulness-based interventions (MBIs) are a relatively recent addition to this field. It is theorised that focusing on the present moment ameliorates the worry and rumination associated with anxiety and depression, and attention has been proposed as a mechanism of change. However, the literature for children is in need of validation studies of MBIs.

The overall aim of this study was to conduct a randomised controlled trial (RCT) of Mindfulness-Based Cognitive Therapy for Children (MBCT-C), for children aged 9-12 years, as a preventive mental health program. Responding to critiques of MBIs in the literature, the research includes: multi-respondent data (children, their parents and teachers); both self-report and objective measures; exploration of attention as a mechanism of change; and follow-up data from 3- and 6-months post-intervention.

A pilot study was conducted with children (*n*=26) in primary schools (*n*=2). In a mixed methods evaluation, qualitative analysis (participant interviews/feedback) was triangulated with quantitative pre- to post-participation measures. Results demonstrated feasibility and acceptability of MBCT-C for (*n*=22) children with internalizing difficulties. The qualitative data provides a rich picture of the experience of participating in MBCT-C, and changes observed within the children.

An RCT was then implemented with children experiencing internalizing difficulties (*n*=89), from primary schools (*n*=3). A Cognitive behaviour therapy (CBT) program was selected as the control condition, providing comparable active components and known effect sizes. Children were randomised to program group within schools, and multi-level mixed models provided between- and within-group effects. Contrary to the hypotheses, only limited differences were found between programs. Pre- to post-intervention effects were similar for both programs, and were mostly small to moderate,

for measures including anxiety, depression, attention, and quality of life. Preliminary mediation analyses did not support the hypothesis that attention was a unique mediator of change for MBCT-C compared to CBT. Follow-up data showed that where change had occurred, effects continued to strengthen. Compared to baseline, 6-month post-intervention effects were similar for each program, and were large for anxiety and depression, attention control, and shifting attention.

This study provides the first RCT of MBCT-C compared to an active control condition. It demonstrates feasibility and acceptability in a new culture and setting (Australian primary schools) and provides a robust test of MBCT-C in "real life" setting. Overall it shows that MBCT-C may be used as a clinically-oriented preventive program in schools to reduce children's internalizing symptoms. The finding that MBCT-C was equally effective to a well-established CBT program is considered a positive for MBCT-C, given the extensive evidence-base available for the CBT program selected. The results also challenge the theory that attention is a unique component of change for MBCT-C. Future studies could continue to explore: possible mechanisms of change; specific factors that might predict whether a child is more likely to respond to MBCT-C or CBT; and effectiveness of MBCT-C for children with diagnosed anxiety or depression.

DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

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Kathleen Wright

Signed: _____ Date: _____

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At this moment in time, when this period of life as a student is concluding, my thoughts have been returning to the beginning of this journey. My decision to give up a career in marketing and to return to Adelaide to study psychology was based on a motivation to pursue work that was meaningful, where it would be possible to help others. This motivation was also what drove this particular research stream. Although I was blissfully unaware of how much work a combined PhD and Masters would be, and how hard some stages of it would become, it was, and is, incredibly heart-warming to realise that the programs implemented actually did make a meaningful difference to many of the children involved. To the parents, teachers, and children who shared personal feedback about how the mindfulness and CBT programs helped you, thank you. Your stories are still with me, and are a constant reminder of why this research is important.

OVERVIEW

Outline of Thesis

This research aimed to determine whether Mindfulness-Based Cognitive Therapy for Children (MBCT-C) could be successfully implemented as a preventive therapy for mental health difficulties with Australian primary school children aged 9-12 years. Although the application of mindfulness-based interventions (MBIs) for children has grown rapidly, the evidence for their effectiveness is still preliminary. Rather than add to the heterogeneity of MBIs that have been tested in small studies, a decision was made at the beginning of this research to select a clinically-oriented program with a published protocol, that had not yet been validated in Australia.

Within this research, MBCT-C was subject to an uncontrolled pilot test aiming to determine whether it would be feasible and acceptable to implement within Australian primary schools. It was then compared to a well-established cognitive behaviour therapy (CBT) program in a randomised controlled trial (RCT), with follow-up data at 3- and 6-months post-intervention. This research provides several unique contributions, including a rich qualitative description of the experience of participating in MBCT-C, a RCT of MBCT-C compared to an active control condition, provision of follow-up data with comparisons to the active control condition, and use of multi-informant, self-report and objective measures.

The structure of this thesis follows the outline of research described above. Chapter 1 provides an introduction, literature review, and research aims. Chapter 2 contains the manuscript for the pilot study. Chapter 3 contains the first manuscript for the RCT, including full reporting of all aspects of the trial, pre- to post intervention and preliminary mediation analyses. Chapter 4 contains the second manuscript for the RCT, including analysis of the follow-up data. Chapter 5 provides a synthesis of all findings, implications of the research, limitations, future directions, and concluding comments. A summary of the 12-week MBCT-C program is provided in Appendix A.

All references are provided at the end of the thesis. Tables are provided within publications at the point of reference, and are numbered consecutively within each chapter. Additional online supplementary material that was submitted with each manuscript is provided as a supplement at the end of each manuscript chapter, and numbered consecutively within the relevant chapter. A CONSORT checklist is provided for the RCT, as it was also submitted with the journal manuscript. For the purposes of this thesis document, page number references within the checklist have been updated to reflect the relevant page within the current document. American English was a publication requirement for each of the three submitted manuscripts. In all other chapters Australian English is used.

Outline of Candidature

This thesis was completed as part of a combined Doctor of Philosophy/Master of Psychology (Clinical), at the University of Adelaide. The program provides candidates with the opportunity to complete a PhD (3 years equivalent full time), with the coursework and practical placements of the Clinical Psychology Masters (2 years equivalent full-time). Within this program, the PhD research is required to be of relevance to clinical psychology. If successfully completed, the combined program satisfies the requirements for registration as a Psychologist, and provides a pathway to future endorsement as a Clinical Psychologist. The research contained within this thesis, along with six Masters coursework subjects, and three clinical placements (a total of 1250 placement hours), were all completed within 5 years equivalent full time study.

Funding for this research was provided by the University of Adelaide's School of Psychology, which also provided travel grants for presentation of results at two international conferences. An additional $1000 travel grant was provided by Healthy Development Adelaide. From 2012-2015 a stipend was also received, as part of an Australian Postgraduate Award scholarship.

LIST OF ABBREVIATIONS

Abbreviation	Full description
ACS	Attention Control Scale
ACT	Acceptance and Commitment Therapy
ADHD	Attention deficit-hyperactivity disorder
BMSLSS	Brief Multidimensional Students' Life Satisfaction Scale
BPM	Buddhist Psychological Model
CAMM	Child and Adolescent Mindfulness Measure
CBT	Cognitive behaviour therapy
CHS	Children's Hope Scale
CPT-Domain	Continuous Performance Test domain score (correct responses minus errors)
CPT-RT	Continuous Performance Test average reaction time for correct responses
CYRM-12	Child and Youth Resilience Measure
MBCT	Mindfulness-Based Cognitive Therapy
MBCT-C	Mindfulness-Based Cognitive Therapy for Children
MBI	Mindfulness-based interventions
MBSR	Mindfulness-Based Stress Reduction
PQOL	Pediatric Quality of Life Scale
RCADS	Revised Child Anxiety and Depression Scale
RCT	Randomised Controlled Trial
SAT-Domain	Shifting Attention Test domain score (correct responses minus errors)
SAT-RT	Shifting Attention Test average reaction time for correct responses
SDQ	Strengths and Difficulties Questionnaire.
TAU	Treatment as usual
WHO	World Health Organization
YLOT	Youth Life Orientation Test

CHAPTER 1. INTRODUCTION AND LITERATURE REVIEW

1.1 Preamble

This chapter provides an overview of the literature relating to mindfulness-based interventions (MBIs) with children. An overview of the problem of anxiety and depression in young people is first provided, including the unique developmental and social challenges of adolescence. Options for prevention and treatment of mental health difficulties are outlined, and a rationale for introducing and testing MBIs is presented, including Mindfulness-Based Cognitive Therapy for Children (MBCT-C; Semple & Lee, 2011). Specific considerations for the research include possible mechanisms of change, and the role of schools in providing mental health support for young people. Finally, the aims and objectives of the thesis are provided.

1.2 Mental Health in Young People

Mental health difficulties are highly prevalent worldwide. According to the World Health Organization (WHO), about 20% of the world's children and adolescents have mental health difficulties, mental disorders are one of the leading causes of disability, and are a leading risk factor for other diseases (World Health Organization, 2017a). Anxiety and depression are among the most common mental disorders (World Health Organization, 2015). For about half of cases of mental disorders, onset is during childhood and early adolescence (World Health Organization, 2017c), with anxiety having an earlier median age of onset (11 years) compared to depression (30 years; Kessler et al., 2005). Depression and anxiety in children and young people appear to be linked, with findings that anxiety in childhood was linked to depression in later life (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998), and generalised anxiety and depression in adolescence cross-predicted those same disorders in later life (Copeland, Shanahan, Costello, & Angold, 2009). In childhood, symptoms of mental health difficulties may be classified as internalizing or externalizing. Internalizing difficulties refers to problems or disorders of emotion or mood caused by difficulties regulating negative emotion, which may manifest as shy or withdrawn behaviour, frequent worrying, self-denigrating

comments, and low self-confidence. Externalizing difficulties are easiest described as "acting-out" behaviours, including disruptive, harmful, or problem behaviours that are directed at persons or things (Terzian, Hamilton, & Ling, 2011).

In Australia, a large national study of children and adolescents aged 4-17 years (*n*=6,310) measured the presence of mental disorders using structured diagnostic interviews (D. Lawrence et al., 2015). Anxiety disorders were the most prevalent for females of all ages (6.1% for 4-11 years, and 7.7% for 12-17 years), and the second most common for males (7.6% for 4-11 years, 6.3% for 12-17 years). Depression was more common in children aged 12-17 years (4.3% of males, 5.8% for females) compared to children aged 4-11 years (1.1% for males, 1.2% for females). It is also noted that comorbidity was present, with 30% of these children and adolescents experiencing more than one class of mental disorder within the previous 12 months (D. Lawrence et al., 2016). In addition to children who meet diagnostic criteria, there are also likely to be a number of children experiencing above-average symptoms of anxiety and/or depression (above-average for their age and gender), who are not yet meeting the diagnostic threshold (D. Lawrence et al., 2015; Patton et al., 2014).

Children and adolescents with poor mental health are at increased risk of poorer academic performance and educational outcomes, impaired functioning in daily life, the experience of stigma, self-harm and/or suicide, substance abuse, and teenage pregnancy (Patel, Flisher, Hetrick, & McGorry, 2007; World Health Organization, 2017c). Anxiety and depression are associated with days absent from school (because of the effects of the disorders), and this was higher for adolescents and highest for those experiencing depression (D. Lawrence et al., 2015). An Australian prospective cohort study of adolescents found that the experience of elevated symptoms of mental illness in adolescence predicted the presence of a mental disorder later in adolescence, or in adulthood (Patton et al., 2014). However, the study also found that not every person who experienced mental health difficulties during adolescence went on to experience a mental disorder, and shorter symptom duration during adolescence predicted healthier outcomes

later in life. The authors therefore speculate that interventions which aim to reduce symptom duration may prevent mental illness from occurring in the future (Patton et al., 2014). Finding ways to reach children with prevention and early intervention programs was identified as a priority for public health (The Department of Health, 2014).

1.2.1 Mental Health Service Use by Children

Access to mental health treatment appears to have improved in recent times, with just over half of Australian 4-17 year olds who met criteria for a mental disorder accessing mental health services within a 12 month period (D. Lawrence et al., 2016). Increasing use of mental health services in schools was one of the major trends, for children of all ages (D. Lawrence et al., 2015). The increased service use is encouraging, yet there remains a substantial proportion of children meeting criteria for a mental disorder who have not accessed services. For anxiety, nearly four in ten of all children who met criteria for an anxiety disorder (and six in ten for those who met diagnostic criteria but with mild symptom severity) had not accessed mental health services. For depression, two in ten of all children meeting diagnostic criteria (and four in ten who met diagnostic criteria but with mild severity) had not accessed mental health services (D. Lawrence et al., 2015). As discussed earlier, these numbers do not capture sub-clinical cases. When examining the characteristics of children who did access mental health services, only half of children (50.4%) met criteria for a mental disorder, whereas a further 40.0% were classified as having sub-threshold symptoms of a mental disorder, and the remainder (9.6%) were within normal ranges (D. Lawrence et al., 2016). It is possible that the latter two groups were children accessing services for relapse prevention, but it is also likely that there is growing demand for services to help manage escalating symptoms of mental health difficulties, in order to prevent future mental illness.

1.2.2 Unique Challenges of Adolescence

Adolescence is traditionally defined as being the period of age from 10-19 years, but the specific age range may vary between societies and between individuals, due to differences in social, environmental, and cultural factors, as well as developmental

differences from person to person (World Health Organization, 2017b). Adolescence is a time of great change. Physical changes include the body growing taller and developing greater muscle mass, continued neurodevelopment, and hormonal changes associated with puberty and sexual maturation. In addition to this, psychosocial maturity includes the development of a sense of self and one's place in the world (which can be a difficult process), an increase in independence from one's parents, transition from primary to high school, and a changing role in society (World Health Organization, 2017b). People in this age group have much in common with those in other age groups, but also face unique challenges, as it is typically a complex psychosocial period, which increases vulnerability to emotional difficulties and mental illness (Department of Health and Ageing, 2004; Purcell, Scanlan, Patch, & Jorm, 2010; World Health Organization, 2017b).

1.3 Prevention and Treatment of Childhood Mental Health Difficulties

A number of prevention and treatment options to address childhood mental health difficulties are available, and may be implemented at an individual or group level. Individual therapy offers the opportunity to tailor treatment to a child's specific presenting symptoms and needs, and more therapist time is invested per child compared to group therapy (Morrison, 2002). Group therapy offers other benefits, such as learning from others' experience, potential for social cohesiveness, and group members as co-therapists (Morrison, 2002; Tucker & Oei, 2007). Studies have found that individual and group therapy can have equivalent efficacy (Manassis et al., 2002; Tucker & Oei, 2007), although not for all mental health difficulties; e.g. individual therapy is more effective for children who have experienced severe trauma (Tucker & Oei, 2007).

Group-based interventions may be conducted as universal, selective, indicated, or treatment programs. Universal programs are offered to all children, regardless of whether they are displaying symptoms of mental health difficulties (e.g. whole-class, or whole-school programs), and are used for reasons such as building resilience, reducing stress, or enhancing general mental health. Selective programs are targeted at children in population groups at elevated risk of developing a mental disorder, such as being a child

of a parent with a serious mental disorder, or living in a low socio-economic status area. Indicated programs are intended to reach children who are displaying symptoms of mental health difficulties such as anxiety and depression, but not yet receiving treatment. Group treatment programs typically involve psychotherapy treatments for small groups of people who share a common mental disorder diagnosis. Within the literature, universal, selective and indicated programs are frequently classified as "preventive" primary interventions, as they aim to provide children with skills and strategies to cope with difficult internal and external experiences, and thus prevent a mental disorder from developing (P. J. Lawrence, Rooke, & Creswell, 2017; Rasing, Creemers, Janssens, & Scholte, 2017; Werner-Seidler, Perry, Calear, Newby, & Christensen, 2017; World Health Organization, 2004). Effect sizes for universal programs tend to be smaller than selective or indicated programs, with little to no difference between the latter two (Horowitz & Garber, 2006; Neil & Christensen, 2009). An economic evaluation of interventions designed to prevent mental disorders found that there is good evidence for the value of preventive programs for anxiety and depression (Mihalopoulos & Chatterton, 2015)

Prevention models for mental illness are frequently based on treatment models, sharing key components such as psychoeducation, identification of thoughts, emotions, and behaviours, and the links between each component. Common treatment models for childhood mental illness include cognitive behaviour therapy (CBT), interpersonal therapy, and mindfulness and acceptance based therapies (Rasing et al., 2017).

1.4 Cognitive Behaviour Therapy

CBT is the recommended treatment for many childhood mental disorders, including anxiety and depression, and many preventive programs are CBT-based. A Cochrane review found that CBT was an effective treatment for just over 50% of children with a diagnosed anxiety disorder; however, this means that nearly half of children still met diagnostic criteria after treatment (James, James, Cowdrey, Soler, & Choke, 2013). Meta-analyses have also found that CBT is not superior in effectiveness to other active

treatments for anxiety and depression in children and adolescents (James et al., 2013; Spielmans, Pasek, & McFall, 2007). A review using meta-analytic procedures found that although earlier estimates of effect sizes for CBT in treating adolescent depression were very large (post-treatment effects greater than 1), later trials using more robust methodology compared CBT to other active treatments or placebo controls and found effect sizes to be very small (Klein, Jacobs, & Reinecke, 2007). A recent review of meta-analyses (*n*=36) of CBT treatments for childhood anxiety and depression also highlighted that there are very few randomised controlled trials (RCT) that compare CBT to active control conditions beyond immediately post-intervention (Crowe & McKay, 2017). From these results it is clear that even if CBT is an effective treatment of anxiety and depression in youth, not all children respond to it. Furthermore, even those who do respond to CBT may still suffer relapse or experience ongoing depressive symptoms (James et al., 2013; Klein et al., 2007).

CBT includes a wide range of cognitive and behavioural techniques. Its overall aim is to teach awareness of, and links between, thoughts, emotions, behaviours, and bodily sensations, before attempting to change maladaptive thoughts. In adults, CBT attempts to uncover schemas: automatic ways of interpreting information gathered from the external or internal world (Wright, Basco, & Thase, 2006). In CBT programs for children, although changes in schemas may occur, they are not directly targeted. Instead, the focus is usually on changing maladaptive thinking or behaviours into more effective ones, through activities such as generating alternative positive thoughts to replace unhelpful thoughts, teaching problem-solving skills, and helping a child to develop graded exposure tasks for feared activities such as doing a presentation in class (Barrett, Shortt, Fox, & Wescombe, 2001).

The reason for the limited efficacy of CBT with children is not yet known. The exact components that bring about change in CBT are not yet clearly understood, as component analyses have been limited and results are inconclusive (James et al., 2013; Spielmans et al., 2007). One theory provided within the literature is that (even with

modifications for children) the cognitive components of CBT may be beyond the developmental capabilities of most young people, particularly children, young teens, or people experiencing delayed cognitive development (Frankel, Gallerani, & Garber, 2012; Venning, Kettler, Eliott, & Wilson, 2012; Vøllestad, Nielsen, & Nielsen, 2012). Prior to providing an outline of this theory, it should noted that other researchers in the field have highlighted that the number of studies comparing effects of CBT for children of different ages is small, findings have been inconsistent, and review studies have been impeded by methodological limitations of included studies (Bennett et al., 2013; Kendall & Peterman, 2015). Therefore, at this time, it remains a proposal based on findings from the developmental psychology literature. Proponents of this theory cite findings that CBT may be more effective during the teenage years, when greater development has occurred, arguing that components of the brain responsible for emotions (amygdala, limbic system) develop prior to the prefrontal cortex (responsible for complex decision making and cognitive control). Related to this, they argue, according to Piaget's theory, the development of formal operational thought during the teenage years allows one to be able to perform more complex abstract reasoning (Miller, 2010), and that some individuals will never fully develop this capability. If these developmental stages have not yet been reached, it may be difficult for children and adolescents to undertake the more complex mental tasks involved in CBT, in an attempt to regulate strong emotion. For example, younger and early adolescent children may grasp a skill in-session, but not be able to generalize that learning to other situations in day-to-day life. Also, CBT is a multi-component process, and although a child may grasp individual components, they may struggle to combine them. Furthermore, activities in CBT may require causal or hypothetical reasoning, abstract thinking, and/or self-reflection, all of which develop at different rates in different children (Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012).

There is evidence to suggest that, for adults, it is possible to achieve clinically significant improvements in symptoms of anxiety and depression without challenging

maladaptive thoughts (as a route to changing schemas and core beliefs). It has been found that a large proportion of gains in CBT occur early in treatment, before any schema-change work is initiated (Longmore & Worrell, 2007). There is also growing evidence showing that results of CBT may be comparable with "third wave" therapies (Vøllestad et al., 2012), including Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2009) and Acceptance and Commitment Therapy (ACT; S. C. Hayes, Strosahl, & Wilson, 1999). It is noted, however, that CBT remains the recommended first-line psychological treatment, particularly as some third wave therapies (such as MBSR) are not recommended as primary interventions in the acute phase of a diagnosed mood disorder (Dobkin, Irving, & Amar, 2012).

1.5 Mindfulness

Mindfulness is taught both within MBIs, which primarily focus on mindfulness meditation practice, and as a component within other therapies including ACT (S. C. Hayes et al., 1999), and Dialectical Behaviour Therapy (Linehan, 2014). There is ongoing debate in the literature about the definition of mindfulness, but one of the most commonly cited definitions is that mindfulness is "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness meditation differs from the intention of other meditative traditions (such as transcendental, Zen, Yoga Nidra, and others), where the focus is on a mental object such as a repeated word, mantra, visual image, or puzzle, in order to draw awareness away from other ongoing cognitive processes (i.e. thinking), and therefore achieve a relaxed or meditative state (Waters, Barsky, Ridd, & Allen, 2015).

1.5.1 Mindfulness Theory

Within the modern Western context, mindfulness has been implemented and researched for around 40 years, although the concept is much older. The modern Western understanding of mindfulness comes from Buddhist traditions, but is secular in nature.

Debates about the definition of mindfulness come in part from differences in translation and interpretation of Buddhist scholarly texts, and whether modern secular definitions reflect the original meaning. In a review, Creswell (2017) found that two common features are shared across different modern Western definitions: the grounding of attention in one's present moment experience (both internal experiences such as thoughts, emotions, and body sensations, and external sensory stimuli from the five senses); plus the adoption of an attitude of openness or acceptance towards one's experience. This attitude is further described as being curious, detached, and accepting, with a non-reactive orientation. It is not a passive resignation, but rather an invitation for all experiences to be present even if they feel difficult. According to Buddhist teachings, this mindful awareness is thought to be an innate human capacity within all of us, regardless of whether it has been formally taught (Creswell, 2017).

Attempts have been made to define and measure constructs that are believed to be components of mindfulness. One theory is that mindfulness involves three interconnected elements: attention, attitude, and intention (Holas & Jankowski, 2013; S. L. Shapiro, Carlson, Astin, & Freedman, 2006). Attention in this context includes several components: focused, broad, and sustained attention, and skills in switching from one stimulus to another. "Intentional attention" can be considered as the self-regulation of attention. Attitude refers to the curious, non-reactive, and non-judgmental stance adopted in mindfulness practice, and intention refers to the intention to practice and/or the specific intention within a practice (such as the intention to notice what is present within the body, mind, or breath; Burke, 2010). It is thought that the use of these three components during mindfulness practice leads to decentering from one's present-moment experience. From this decentered perspective there may be a shift in one's relationship with internal events (thoughts, body sensations, and emotions), that may allow for disengagement with habitual patterns or mind states, and to respond with awareness, rather than automatically (Burke, 2010).

The Buddhist Psychological Model (BPM; Grabovac, Lau, & Willett, 2011) provides further explanation of mindfulness theory, by describing the process by which mindfulness practice may lead to improvements in mental wellbeing. The BPM is a synthesis of Buddhist teachings and modern Western secular mindfulness practices. It involves three stages: developing awareness of mental processes (defined as including both physical sensations and cognitions); the use of attention regulation; and development of insight. These are supported by an attitude of acceptance and curiosity. As such, a person may first learn to become aware of, and identify their emotions and thoughts. Use of attention regulation in mindfulness involves holding only one object in awareness at a time, and as attentional resources are limited, this has the effect of momentarily interrupting other habitual mental processes (such as worry or rumination). Insight may develop through continued mindfulness practice, and refers to a direct, non-conceptual understanding that internal experiences (such as a thought or emotion) are temporary mental events (and not permanent aspects of the self), and therefore need not be reacted to. Furthermore, insight involves an understanding that habitual reactions to internal experience, such as attempts to suppress a thought or emotion (or to chase feelings of pleasure), may lead to greater suffering. Within the BPM, a distinction is made between short-term alleviation of distress that may occur through attention regulation (i.e. shifting attention away from a negative thought, and back to the breath), and enduring improvements in wellbeing that may occur with the development of insight (Grabovac et al., 2011).

1.5.2 Mindfulness-Based Interventions

MBSR was the first Western secular MBI to be advanced within the scientific literature. Developed in 1979 for people with chronic pain (Kabat-Zinn, 2003), it is an 8-week program, with a two-hour group session each week, plus a day retreat at about the halfway point, led by an experienced mindfulness practitioner. The weekly session involves guided mindfulness practices, and group discussion of what occurred within the meditation. There is also an audio-guided home practice, for up to one hour per day.

Within MBSR, through mindfulness meditation practices, participants are invited to bring their attention to sensations within their body, through body scans, gentle yoga practices, and mindful movement exercises. Over time, this mindful awareness is also directed towards the activity of the mind (i.e. thinking), and external sensations (such as sounds). There are also regular discussions regarding how to apply mindfulness in everyday life, including dealing with stress (Kabat-Zinn, 2009). The paradox of mindfulness practice described within MBSR is that mindfulness meditation is approached with an intent of simply observing what is present, rather than aiming to rid the body of unwanted inner experiences (such as physical pain). Through this awareness, pain may reduce, but this is not the intention of practice (Kabat-Zinn, 2009).

The theory and structure of this program has formed the basis for other MBIs, including MBCT (Segal et al., 2002). MBCT is heavily based on MBSR, but was adapted for prevention of depressive relapse in adults. It follows a similar structure to MBSR (an 8-week program with a one-day silent retreat), and 45 minutes of daily home practice. Compared to MBSR, MBCT has a greater focus on the role of cognition in triggering depressive decline. MBCT aims to teach awareness of thoughts and feelings, and furthermore to understand these as temporary mental events, rather than facts about the self or external environment. Through this decentering, it is thought that being able to detach from one's thoughts helps to build awareness of the escalation and spiralling nature of negative thinking and emotion that may lead to a depressive relapse. This is a distinct difference to traditional CBT, as there is no attempt to change maladaptive thoughts (Teasdale et al., 2000).

1.5.3 Evidence for Mindfulness-Based Interventions: Adult Populations

A recent review found that there is good evidence that MBSR reduces pain symptoms and improves functioning in patients with chronic pain compared to treatment as usual, although it was equivalent to CBT (Creswell, 2017). There is also good evidence for MBCT for preventing relapse of depression (Clarke, Mayo-Wilson, Kenny, & Pilling, 2015; Creswell, 2017; Piet & Hougaard, 2011). A meta-analysis of MBIs as

treatment for people with a current anxiety or depressive disorder found that they were effective for depression but not anxiety, although when compared to active controls there was no difference between groups (Strauss, Cavanagh, Oliver, & Pettman, 2014). Another meta-analysis explored mindfulness-based therapy for symptoms of anxiety and depression for a range of participant conditions (cancer, generalised anxiety disorder, and other psychiatric and medical conditions). Overall they found moderate to large effects for the reduction of symptoms of anxiety and depression from pre- to post-intervention; for a sub-group of people with a diagnosed anxiety or mood disorder, effects were very large (Hofmann, Sawyer, Witt, & Oh, 2010). A recent meta-analysis of MBSR for healthy non-clinical populations found that it was moderately effective for improving stress, depression, anxiety, distress, and quality of life (Khoury, Sharma, Rush, & Fournier, 2015). A meta-analysis of MBIs in pregnancy found significant benefits for stress, depression, and anxiety compared to control groups (Dhillon, Sparkes, & Duarte, 2017).

1.5.4 Mindfulness with Children and Adolescents

Although rapidly developing, the literature for mindfulness with children and adolescents is not yet as advanced as it is for adults. A broad variety of MBIs have been implemented with children, and compared to the adult literature there has been a greater focus on MBIs aiming to improve wellbeing and prevent mental health difficulties, rather than treatment of mental disorders (Zoogman, Goldberg, Hoyt, & Miller, 2015). Some MBIs for children are based on adult programs such as MBSR and MBCT, with adaptions appropriate for developmental age; MBCT-C is one of these (Semple & Lee, 2011). Many other programs have been informed by (although are not structured upon) MBSR, including universal whole-school programs such as “.b” ("dot be"; "Mindfulness in Schools Project," 2017).

1.5.5 Evidence for Mindfulness-Based Interventions: Child and Adolescent Populations

There is a growing evidence base suggesting that mindfulness can be an effective intervention to improve wellbeing in children, both individually and in groups. Systematic and meta-analytic reviews have found that MBIs with children may improve symptoms of mental health difficulties, attention, mindfulness and wellbeing (Felver, Celis-de Hoyos, Tezanos, & Singh, 2016; Langer, Ulloa, Cangas, Rojas, & Krause, 2015; Zenner, Herrnleben-Kurz, & Walach, 2014; Zoogman et al., 2015). However, these reviews also identified that the performance of MBIs compared to active control conditions is not known, as few RCTs using active controls were available, and even less had assessed performance at follow-up time points. Furthermore, the reviews identified methodological concerns including: heterogeneity in terms of the wide variety of mindfulness interventions tested, study designs, and methods employed; a lack of reporting of key elements of fidelity and research methods; and heavy reliance on self-report measures. (Felver et al., 2016; Langer et al., 2015; Zenner et al., 2014; Zoogman et al., 2015). The reviews made several recommendations, including a need for further validation and effectiveness studies for existing evidence-based programs (rather than creation of new programs), a need for well-designed RCTs that use an appropriately matched active control condition, use of third-person and objective measures (rather than a reliance on only self-report), clear reporting of fidelity and methodology, and follow-up data beyond post-intervention (Felver et al., 2016; Langer et al., 2015; Zenner et al., 2014; Zoogman et al., 2015).

1.6 Mindfulness-Based Cognitive Therapy for Children

MBCT-C was developed in New York (USA) as a small-group treatment for anxious children (Lee, Semple, Rosa, & Miller, 2008; Semple & Lee, 2011; Semple, Lee, Rosa, & Miller, 2010). MBCT-C is based on MBCT, but with several amendments from the adult format. Whereas adult MBCT mindfulness practices are up to 45 minutes in length, MBCT-C uses much shorter practices in line with children's lower attention span.

The format of twelve 90-minute weekly sessions was based on a calculation of the total hours required for adult MBCT, reduced to a session length that is more appropriate for children (see Appendix A, 187 for a summary of the 12 sessions). The key practices of "raisin mindfulness" (mindfully eating a raisin), mindful breathing, mindful movement, the three-minute breathing space, and the body scan, are all included but shortened. The children begin by practising three mindful breaths and progress to the three-minute breathing space throughout the program. The body scan (called "mindfulness of the body") is only practised three times, for between 5-15 minutes depending on the attention span of the children (compared to adult MBCT where it is practised for 45 minutes daily for several weeks). In the place of the longer adult practices there are interactive practices involving the five senses (for example, mindful eating, mindful touching and so forth). The interactive practices were added to engage children and provide active learning opportunities. They are intended to be fun, although their ultimate aim is to teach present moment awareness. The recommended group size is six children with one facilitator, although this can be increased to twelve children with two facilitators. The program is intended to be delivered (facilitated) by therapists. It is recommended that facilitators have participated in adult MBCT or MBSR and have regular and ongoing personal mindfulness practice (Semple & Lee, 2011).

Within MBCT-C there is no direct attempt to restructure thoughts (as there is in CBT). Instead, the focus is on the child's relationship to their thoughts, emotions, and bodily sensations. The theory is that finding a different way to relate to thoughts, emotions, and bodily sensations can reduce anxiety. The authors of MBCT-C explain that each moment in life consists of perceptions, sensations, thoughts, emotions, and interactions. Humans put these together into schemas, which are believed to help minimise information-processing requirements. However, these schemas also mean that past experience influences our expectations, and judgements of, the present moment. Therefore, our thoughts about the current situation may not be based on the reality we are being faced with in the present moment. One may expect or perceive a threat where in

fact there isn't any, and people can become "trapped" inside these worries about future events, or ruminate over past events. Through mindfulness practice in MBCT-C, a child may first grow in awareness of their internal experiences through focussing attention on the moment by moment experience of the breath or body. In doing so it is normal to notice that the mind is distracted by thoughts, emotions, or other feelings in the body. Children are invited not to attempt to change any internal experience, but rather to acknowledge it with a "kindly intention" (i.e. a kindly attitude), and to return to the object of the focused attention (e.g. the breath). As the program progresses, shifting attention is introduced, for example shifting attention between breath, body, and mind, and between internal and external experiences. In time a child may start to notice the inter-relations between thoughts, feelings, body sensations, and external events, and they may come to recognise moments where they may choose to react with awareness instead of on "automatic pilot". For example, if they notice that a past experience has influenced their understanding of the present moment, they may be able to make a conscious, rather than automatic, decision about what to do in the present (a "choice point"). Whilst change is not a direct objective of MBCT-C, it may occur naturally through mindful acceptance (Semple & Lee, 2011).

1.6.1 Evidence for MBCT-C

Development trials of MBCT-C established its feasibility and acceptability in an out-of-school setting. The children in both the pilot study and randomised wait-list trial were recruited from a remedial reading program, had significant reading difficulties and were displaying indicators of stress and/or anxiety (Lee et al., 2008; Semple et al., 2010). The wait-list trial (n=25) found that MBCT-C significantly reduced parent-reported attention problems (moderate effect) and parent-reported behaviour problems (small effect). Although within the pilot test there was initial evidence to suggest it would be effective in reducing anxiety symptoms, the randomised trial found no differences in self-reported anxiety symptoms between the intervention and control groups. In a post-hoc analysis, data for both the wait-list and MBCT-C group participants were pooled to

simulate an open trial. Within this pooled sample, a statistically significant reduction in anxiety was found (small to moderate effect). Furthermore, a sub-set of six children had clinically elevated symptoms of anxiety before participating in MBCT-C, whereas this reduced to only three children at completion of the program (i.e. half of the children with clinically elevated anxiety had their symptoms reduce to normal levels after participation). In considering possible reasons for these findings, the authors noted that anxiety was measured using two clinical measures, and therefore it was possible that the use of clinical measures in this non-clinical population meant that floor effects limited the instrument's ability to detect change (Semple et al., 2010). Mediation analysis was conducted to test whether the reduction in attention problems mediated the change in behaviour problems from pre- to post-intervention, but the results were inconclusive.

Following the development trials for MBCT-C, an uncontrolled pilot test of MBCT-C was conducted in a clinical setting, for youth (n=10; aged 9-16 years) with anxiety disorders at risk for bipolar disorder (Cotton et al., 2015). The pilot test provided initial evidence that, for this specific population, MBCT-C was feasible and acceptable, and reduced both self-rated and clinician-rated anxiety, improved parent-rated emotion regulation and increased mindfulness (Cotton et al., 2015). A follow-up publication included results of functional magnetic resonance imaging (fMRI) from pre- to post-participation, showing that participation in MBCT-C was associated with activity in brain structures that process internal stimuli (Strawn et al., 2016). To date, there are no peer-reviewed published trials of MBCT-C in an Australian setting.

1.7 Measuring Mindfulness in Children

The measurement of mindfulness in children is an area of debate in the literature. Some measures are downwards extensions of validated adult measures, e.g. the Mindful Attention Awareness Scale for Adolescents (Brown, West, Loverich, & Biegel, 2011). Others have been developed "from the ground up" based on mindfulness theory, e.g. the Child and Adolescent Mindfulness Measure (CAMM; Greco, Baer, & Smith, 2011). A recent systematic review of trait mindfulness measures in adolescents (aged 10-17 years)

found that although it is generally accepted that mindfulness is multifaceted in adults, evidence for multifaceted measures in adolescents is lacking (Pallozzi, Wertheim, Paxton, & Ong, 2017). Measurement in children is complicated because it is an internal process that is difficult to measure objectively from an external perspective. It is not yet known whether the difficulties in understanding the factor structure of mindfulness in children is due to differences in the actual structure of mindfulness in children, or because the current tools are not effectively measuring the construct. The review concluded that despite these limitations there is sufficient evidence of reliability and validity for use of single factor measures of mindfulness in children (Pallozzi et al., 2017).

1.8 Possible Mechanisms of Change

Several mechanisms of change for mindfulness in children have been proposed within the literature, based on mindfulness theory. These include improved attentional capacity, decreased mind-wandering, decentering, emotion regulation, mindfulness, and self-compassion (Felver et al., 2016; Zenner et al., 2014). To date, mechanisms of change are not well understood, in part because only a small number of studies have included mediation or moderation analyses, and there are calls for more research in this area (Black, 2015; Felver et al., 2016; Waters et al., 2015; Zenner et al., 2014). Attention is one of the areas that has shown the most promise to date, with one review speculating that (based on initial results showing the sensitivity of attention measures to change following mindfulness training), it may be the internal psychological mechanism of change (Felver et al., 2016). Attention is also a key component of MBCT-C theory. Within MBCT-C, attention is described as being like a pipeline, which has a maximum capacity. If attention is devoted to worries and concerns, then insufficient attention can be given to experiencing the present moment. Through mindfulness training, it is hypothesized that a child may learn to engage their attention in the present moment, and in doing so, interrupt the processes of worry and cognitive rumination (which are usually accompanied by negative emotion; Semple & Lee, 2011).

1.9 Attention Theory and Measurement

Attention theory and measurement is a continually developing area of the literature. Broadly speaking, attention in children is understood to develop throughout childhood, to be multifaceted, and integrated with other cognitive processes such as executive function, cognitive arousal, working memory, and motivation (Anderson, 2002; Mezzacappa, 2004). Within the literature, attention has been linked to outcomes including mental health and academic performance (Duncan et al., 2007; Fu, Taber-Thomas, & Perez-Edgar, 2017; Grimm, Steele, Mashburn, Burchinal, & Pianta, 2010; Morales, Pérez-Edgar, & Buss, 2014; Romano, Babchishin, Pagani, & Kohen, 2010). One of the ways that attention has been linked to mental health is through a construct called attention control, "the ability to organise incoming stimuli in order to maintain a calm state of mind, delay gratification, tolerate change, and create a cognitive and behavioural response to selected stimuli exclusively" (Muris, Mayer, van Lint, & Hofman, 2008, p. 1496). Attention control is thought to be involved in emotion regulation, with higher levels of attention control being associated with better regulation of negative emotions. When faced with stressful or challenging events, being high in attention control may help a person reduce their emotional reactivity, which may in part be through employing more adaptive, flexible, coping strategies (Muris & Ollendick, 2005). Studies with children found negative correlations between attention control and symptoms of anxiety and depression, and a positive relationship between attention control and self-efficacy (Muris & Field, 2008; Muris, Mayer, et al., 2008; Muris, Meesters, & Rompelberg, 2006). There are also similarities between attention control and mindfulness, as both involve a capacity to willingly divert and sustain attention towards a focal object, and both may be trainable (Quaglia, Brown, Lindsay, Creswell, & Goodman, 2015). Furthermore, as discussed, attention regulation is included in common definitions of the components of mindfulness (Burke, 2010; Creswell, 2017; Grabovac et al., 2011).

When considering measurement of attention, it is noted that a number of attention measures are available, including both self-report and objective measures. Different

attention measures aim to tap into different aspects of attention, such as attention control, shifting, and sustained attention (Anderson, 2002; Mezzacappa, 2004; M. B. Shapiro, Morris, Morris, Flowers, & Jones, 1998). It is likely that self-report and objective measures of attention tap into different constructs, as it has been found that a self-report measure of attention control was only weakly associated with an objective attention measure (Muris, Mayer, et al., 2008; Muris, van der Pennen, Sigmond, & Mayer, 2008; Reinholdt-Dunne, Mogg, & Bradley, 2013). These results suggest that a child's perception of their attentional ability may differ from their performance on an objective test. For this reason, if exploring the relationship between mindfulness and attention in children, it would be of interest to use both self-report and objective attention measures. For example, self-report attention control could be used to measure attention regulation, and objective attention tests could be used to measure switching and sustained attention. If, as discussed earlier, these three attention constructs are components of mindfulness (Burke, 2010), then it could be expected that they each would uniquely mediate the relationship between participation in MBCT-C and mindfulness.

1.10 Mindfulness Interventions in Schools

In Australia, schools have been found to play an important role in providing assistance and linking children to support for mental health difficulties, with 11.5% of all children aged 4-17 accessing support for emotional or behavioural difficulties through school services. This included counselling services, emotional and behavioural learning programs, and other factors such as school staff and teachers helping parents identify and seek referrals for their child's emotional or behavioural problems, and supporting students on an informal basis (D. Lawrence et al., 2015). Within the literature, schools have also been the setting for many preventive and treatment programs for mental health difficulties including MBIs (Paulus, Ohmann, & Popow, 2016). Most studies concerning MBIs in schools have been conducted with healthy populations at a universal level, with effect sizes ranging from no effect to small-moderate effects, for a range of variables including psychological and psychosocial measures (Felver et al., 2016; Zenner et al.,

2014). Smaller numbers of MBIs have been implemented with selective or indicated populations in schools, and those interventions that have been tested have not always published program protocols (Felver et al., 2016). As such, the effect sizes for clinical interventions used for preventive objectives, are not yet known.

Mental health support provided by schools can be considered within the three tiered model of service delivery (Felver, Doerner, Jones, Kaye, & Merrell, 2013). Tier 1 is universal programs, delivered to whole-class/school level regardless of presence of difficulties within individual children. Tier 2 is targeted interventions, where children are clustered in small groups on the basis of shared difficulty, psychosocial or educational needs. Tier 3 is individual intensive interventions, for children with a high level of need. Although the trend for MBI research in schools is towards universal wellbeing programs (Felver et al., 2016), not all schools may choose, or have resources to implement universal programs. Providing schools with a range of evidence-based options can offer them flexibility to implement programs according to the needs of students. As such, small-group mindfulness-based clinical interventions can provide an alternative option at Tier 2, and MBCT-C is one of these; e.g. children showing signs of mental health difficulties could be selected by teachers and/or parents, and participate in MBCT-C within the school environment.

1.11 Strengths-Based Approach

A strengths-based approach to psychology involves promotion of mental health strengths in addition to reducing symptoms of mental health difficulties, as it has been found that boosting mental health strengths can build resilience to mental illness (Seligman, 2008; Seligman & Csikszentmihalyi, 2000). Indeed, the definition of complete mental health adopted by the WHO is “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (World Health Organization, 2014), supported by the overall definition of health, which includes a sense of wellbeing alongside the absence of illness (World Health

Organization, 2014). For these reasons, a strengths-based approach will be taken in this research, i.e. measures that are known to be related to resilience will be included alongside measures of mental health difficulties.

1.12 Aims of Thesis

The overarching research aim was to examine whether MBCT-C could be applied within Australian schools as a preventive program for mental health difficulties. It is known that CBT may be effective for some, but not all children. There are limits to its effectiveness, which provides the opportunity for assessment of newer therapies. MBIs are showing promise for prevention and treatment of mental health difficulties in children, but the literature is in need of validation and effectiveness studies of existing programs, including follow-up data compared to active controls, and exploration of possible mechanisms of change.

On this basis, the first objective was to assess the feasibility and acceptability of implementing MBCT-C as a preventive intervention for mental health difficulties, in a new culture and setting: Australian primary schools. If the pilot study was successful, then a randomised controlled trial would be conducted, including follow-up data beyond post-intervention. The research also aimed to incorporate recommendations from critical literature reviews, including use of multi-respondent data (i.e. not just self-report data from children, but parallel data from parents and teachers), both self-report and objective measures (where feasible), and comparison of MBCT-C to an active control condition in the RCT.

It was decided to implement this research in schools for three reasons. The first was an intention to help prevent mental illness from developing in the future. Within schools it may be easier to reach children showing early signs of mental health difficulties (who are not yet being assisted by mental health services) than it would within the community. The second reason was that given the increasing role that schools are playing in supporting children's mental health, it was believed that providing evidence-based solutions would be of interest to participating schools. The third reason was that

implementing the intervention in schools would provide a “real life” test of the program, rather than a tightly controlled trial whose results may not be readily generalizable.

CHAPTER 2. PAPER ONE

Mindfulness-Based Cognitive Therapy for Children: A non-randomized pilot test in Australian primary schools

2.1 Preamble

The aim of this first study was to conduct a pilot test to assess feasibility and acceptability of MBCT-C in a new culture. At the time that the pilot test was implemented, MBCT-C had only been tested in New York (USA) in development work, and therefore cross-cultural acceptability was not known. Furthermore, the implementation of mindfulness in schools in Australia was still relatively novel, and had not yet reached the current broad acceptance levels. It was anticipated that (if successful) the pilot test would be followed by a randomised controlled trial. Therefore, the pilot test also provided the opportunity to trial the selected battery of measures.

2.2 Statement of Authorship

Title of Paper	Mindfulness-Based Cognitive Therapy for Children: A non-randomized pilot test in Australian primary schools
Publication Status	Submitted for publication
Publication Details	Journal of Child and Family Studies

Principal Author

Name of Principal Author (Candidate)	Kathleen Wright
Contribution to the Paper	Reviewed the literature and formed the research idea. Planned and implemented the research, including gaining ethical approvals, liaising with schools, recruiting MBCT-C facilitators, obtaining informed consent from participants, data collection, and analysis. Responsible for writing and editing the manuscript in collaboration with research supervisors. Submitted the manuscript to the journal. Corresponding author for the paper.
Overall percentage	90%
Certification	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.
Signature	
Date	

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);
ii. permission is granted for the candidate in include the publication in the thesis; and
iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Authors	Associate Professor Rachel Roberts Dr Michael Proeve	
Contribution to the Paper	Supervisors of the PhD research program. Oversaw the research idea conceptualisation and planning. Provided clinical supervision to the MBCT-C facilitators (MP also provided training for MBCT-C facilitators). Collaborated in developing the content and structure of the publication manuscript, and reviewing drafts. Provided advice and guidance for responding to journal reviewer feedback.	
Signatures	Rachel Roberts	Michael Proeve
Date		

2.3 Submitted Manuscript

Title Page

Manuscript Title: Mindfulness-Based Cognitive Therapy for Children: A Non-randomized Pilot Test in Australian Primary Schools

Running Head: CHAPTER 2. PILOT TEST OF MBCT-C

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Trial Registration: Registration of this pilot test was not required.

Role of the funding source: This research was conducted as part of a PhD in Psychology within the University of Adelaide. No other funding was received.

Compliance with Ethical Standards: Approvals were provided by the University of Adelaide's Human Research Ethics Committee, and the South Australian Department of Education and Child Development. All adult participants provided informed written consent. Parents/guardians provided consent for their child, and children provided assent.

Conflicts of interest: The authors declare that there are no conflicts of interest.

Competing interests: The authors declare that there are no competing interests.

Abstract

Mindfulness-based intervention research is rapidly growing, although the evidence for children is still limited. Mindfulness-Based Cognitive Therapy for Children (MBCT-C) was developed in New York (USA), with promising results for anxious children. We conducted a pilot test of MBCT-C as a preventive intervention in Australian primary schools (n=2), in preparation for a Randomized Controlled Trial (RCT). The primary aim was to assess feasibility and acceptability. Children (N=26, age 9-12 years) displaying symptoms of internalizing (n=22) or externalizing (n=4) difficulties, participated in MBCT-C. Qualitative data was triangulated with pre- to post-intervention measures (anxiety, depression, mindfulness, hope, optimism, satisfaction with life, and attention). Overall the program was accepted, and was feasible to implement. Three children with externalizing difficulties withdrew, but the remaining child benefited from participation. MBCT-C was described as being different to any kind of program participated in previously, but the facilitator's mindful and accepting stance helped children feel at ease. For children who engaged with the program, mindful breathing was liked, and used in everyday life. Improvements in children's emotional difficulties were described by many participants, although not all. For a small number of children the change was described as transformational. The qualitative changes described by participants were consistent with the direction of changes seen in the quantitative measures. Results fit with the theoretical basis of MBCT-C. These findings demonstrate that MBCT-C can progress to a RCT within schools for children with internalizing difficulties, and attention could be explored as a mechanism of change.

Keywords: Mindfulness; MBCT-C; Children; Attention; Anxiety,

Mindfulness-Based Cognitive Therapy for Children: A non-randomized pilot test in Australian Primary Schools

In Australia, the 12-month prevalence of anxiety disorders in children is 6.9%, and second only to Attention-Deficit Hyperactivity Disorder at 7.4% (D. Lawrence et al., 2016). Depression is the third most prevalent disorder at 2.8% (D. Lawrence et al., 2016). Anxiety and depression (combined) are the leading contributor to burden of disease and injury for young Australians (Australian Institute of Health and Welfare, 2011). Mindfulness-based interventions (MBIs) have been used to prevent and treat mental health difficulties in children (defined here as persons younger than 18 years) including anxiety and depression. Several reviews have concluded that MBIs show promise with children and do not appear to carry iatrogenic harm (Felver et al., 2016; Zenner et al., 2014; Zoogman et al., 2015). The emerging evidence suggests that MBIs may be more effective than active controls, with effect sizes in the small-moderate range (Zenner et al., 2014; Zoogman et al., 2015). The reviews concluded that findings should be considered as promising, but not yet robust: there was heterogeneity in the interventions implemented, in the outcome measures used, and in whether key aspects of the research were reported. Recommendations included the need for randomized controlled trials (RCTs) of existing interventions using well-matched active control conditions, and a need for reporting of fidelity of implementation, so that future research can better determine which components lead to beneficial outcomes.

Mindfulness-Based Cognitive Therapy for Children (MBCT-C) is an existing MBI, developed in New York (USA) for anxious children aged 9-12 years (Semple & Lee, 2011). MBCT-C differs from school curriculum-based programs such as .b ("dot be"; "Mindfulness in Schools Project," 2017), in that .b is a universal program for general populations (i.e. not intended as therapy), whereas MBCT-C aims to reduce anxiety in children already experiencing symptoms. Development trials of MBCT-C were conducted in an out-of-school setting, including a pilot study (Lee et al., 2008) and wait-list randomized trial (Semple et al., 2010). Children who had significant reading

difficulties and were displaying indicators of stress and/or anxiety were recruited from a remedial reading program (Lee et al., 2008; Semple et al., 2010). The wait-list trial (*n* = 25) found that MBCT-C significantly reduced parent-reported attention problems (moderate effect) and parent-reported behavior problems (small effect), but there was no difference in self-reported anxiety symptoms between groups. Post-hoc analysis of clinically significant change was reviewed for each child's anxiety measures. Six children had clinically elevated levels of anxiety before the trial, whereas only three did on completion, meaning that MBCT-C had been effective for half of these children. In considering possible reasons for these findings, the authors noted that the use of a clinical measure of anxiety in a non-clinical population (i.e. children who had symptoms of anxiety but did not meet diagnostic criteria) may have meant that floor effects limited the instrument's ability to detect change. Since the development trials, MBCT-C was tested in a small pilot study of youth (*n*=10, age 9-16 years) with an anxiety diagnosis who were at risk of developing Bipolar Disorder, and positive initial results were found for anxiety and emotional difficulties (Cotton et al., 2015).

Attention is a key component of MBCT-C theory, and the authors use the metaphor that "Attention seems to be like a pipeline: it can only hold so much" (Semple & Lee, 2011, p. 16). It has a maximum capacity, and if devoted to worries and concerns, then insufficient attention can be given to experiencing the present moment. Systematic and regular mindfulness practices that focus one's attention on the present moment disrupt the processes of worry and rumination that are associated with anxiety. Regulating one's attention in this way is thought to be a key mechanism of change for MBCT-C. As mentioned above, within the MBCT-C wait-list trial there was a reduction in parent-reported attention problems. In addition to this, five children had clinically elevated levels of attention problems at baseline (including two children with diagnosed attention deficit-hyperactivity disorder; ADHD), whereas only one child remained above the threshold at post-intervention (one of the children diagnosed with ADHD). Analysis

of whether the change in attention problems mediated the improvement seen in behavior problems was inconclusive (Semple et al., 2010).

Attention is also one of three mental processes involved in mindfulness practice that are identified in the Buddhist Psychological Model (BPM; Grabovac et al., 2011). The BPM is a synthesis of Buddhist teachings and modern Western secular mindfulness practices, and summarizes the ways in which mindfulness and attention regulation may lead to improvements in mental wellbeing. It involves three stages: developing awareness of mental processes; the use of attention regulation; and development of insight. This fits well with the process of change outlined in MBCT-C (Semple & Lee, 2011). Children first learn to become aware of, and identify their emotions and thoughts, then explore how they relate to experience. Through engagement in mindfulness practice they may become able to disengage with habitual responses, and build mental space within which to respond with awareness. These practices, in time, may build a child's ability to cope with strong emotions or difficult thoughts, and manage their day to day experiences with greater skill.

Attention is understood to develop throughout childhood and adolescence (Mezzacappa, 2004). It has been linked to academic performance (Polderman, Boomsma, Bartels, Verhulst, & Huizink, 2010), and to mental health difficulties through a construct known as attention control. Attention control is defined as "the ability to organize incoming stimuli in order to maintain a calm state of mind, delay gratification, tolerate change, and create an appropriate cognitive and behavioral response to selected stimuli exclusively" (Muris, Mayer, et al., 2008, p. 2). Studies of children aged 8-13 years found that lower levels of self-reported attention control were associated with higher reported levels of psychopathology symptoms including anxiety, depression, and ADHD (Muris, Mayer, et al., 2008; Muris, van der Pennen, et al., 2008). Also of interest was their finding that an objective measure of attention had only weak correlations with emotional and behavioral difficulties (including anxiety and depression), and a weak correlation with attention control. This suggests that a child's perception of their attentional ability

may differ to their performance on an objective test, and that the two constructs appear to have different relationships with measures of emotional difficulties. For this reason, if exploring the relationship between mindfulness training and attention in children, using both self-report and objective attention measures would be of interest.

For children, symptoms of mental health disorders are commonly considered in two clusters: internalizing and externalizing difficulties. Internalizing difficulties relate to problems in regulating emotion (particularly negative emotion), which may present as shy or withdrawn behavior, high levels of worry, negative self-talk, and/or low self-confidence. Externalizing difficulties refers to "acting out" behaviors, such as disruptive, harmful, aggressive, or other problem behaviors that are directed at persons or things (Terzian, Hamilton, & Ericson, 2011). There is growing evidence for the use of MBIs for children with externalizing difficulties, with benefits such as reductions in stress, behavioral difficulties, emotional difficulties (including internalizing difficulties, which also were present for the children displaying externalizing difficulties) and improved attention (e.g. Bögels, Hoogstad, Van Dun, De Schutter, & Restifo, 2008; van de Weijer-Bergsma, Formsma, de Bruin, & Bögels, 2012). The mindfulness interventions used in these trials were similar to MBCT-C in that they were a small group format and highly structured (i.e. a similar composition from week to week). The content was also comparable to MBCT-C, although some interventions included rewards for progress and cooperative behavior, which MBCT-C does not. Given this background, and that there is evidence to suggest that MBCT-C may be effective for children with ADHD in improving attention and reducing behavioral difficulties (Semple et al., 2010), it was of interest to see whether the program could be helpful for children with externalizing difficulties. This would include an exploration of whether MBCT-C would be effective in reducing symptoms of internalizing symptoms for these children, if they are experiencing them.

Positive psychology emphasizes measurement of mental health strengths, rather than a pure focus on presence of symptoms of mental disorders. There is a growing body

of research suggesting that wellbeing is a better predictor of longer-term positive outcomes than the absence of symptoms of mental illness alone (Seligman, 2008). Therefore, the current study focused on both mental health strengths and difficulties.

The overarching aim of this study was to pilot test MBCT-C, in preparation for a RCT. The primary research objective was to explore feasibility and acceptability of the MBCT-C program in Australian primary schools. The secondary objective was to pilot test the battery of quantitative measures prior to implementation in the RCT, and determine whether the direction of effects was consistent with qualitative findings. As discussed above, MBCT-C was developed in New York (USA). Although cultural differences do exist between Australia and the USA, both cultures are Western and also share many similarities. As such, it was hypothesized that the revised MBCT-C program would be acceptable to children, their parents/guardians and teachers; would be feasible for schools and facilitators to implement; would improve measures of mindfulness, attention, and mental health strengths; and reduce symptoms of mental health difficulties.

Method

The pilot study was a non-randomized, analytical observational design. All participants received the intervention and there was no control group.

Participants

Participants were (*n*=26) children, their parent/guardian (*n*=26), school teachers (*n*=9), school principals (*n*=2), a student support officer (*n*=1), and program facilitators (*n*=2). Children's age and gender distribution data is provided within Table 1 (page 32). One participating child was identified by the school as being of Australian Aboriginal background, and one child was identified as having a mild physical disability. No other individual demographic information was collected for the study.

Table 1

Descriptive Statistics for the Overall Sample and by Group

Participants	Group	*n* (girls, boys)	Age	
			Range	*M* (*SD*)
Children				
All	All	15, 11	9-12	10.85 (1.08)
Internalizing difficulties	A-C	15, 7	9-12	10.73 (1.12)
By School and Group				
School 1	A	7, 2	9-11	9.89 (0.78)
	B	5, 3	11-12	11.75 (0.46)
School 2	C	3, 2	9-11	10.60 (1.14)
	D[a]	0, 4	11-12	11.50 (0.58)

[a] Children with externalizing difficulties

Eligibility criteria. For the children experiencing internalizing difficulties the eligibility criteria included being very shy, withdrawn or very quiet, appearing to be very anxious, worrying a lot, or seeming down all the time. For children with externalizing difficulties the criterion was simply being very disruptive in class. For both groups, exclusion criteria included being eight years or younger, 13 years or older, or the presence of a developmental disorder significantly affecting a child's ability to experience and understand emotions or learn new concepts (e.g. Autism Spectrum disorders, Down Syndrome). Program facilitators were recruited from within a university clinical psychology Masters program. They were required to have participated in an 8-week adult mindfulness program, and have a regular and ongoing personal mindfulness practice. Informed consent was a requirement of participation. Consent for children was provided by their parent/guardian, and assent was provided by children.

Settings and locations. The children were from two government-run schools located in an inner-regional town in South Australia. Both schools offered classes from Reception to Year 7, were co-educational, and had between 150 and 400 enrolled students. Data regarding socioeconomic status (SES) of schools is available on the Australian Government website "myschool.edu.au". Approximately 60% of families from

School 1, and 40% of families from School 2, were within the lower two SES quartiles of the total Australian population.

Sampling procedure. Schools were recruited by word of mouth. Once two schools agreed to participate, recruitment ceased. Teachers attended an information session, to receive details about the research and provide informed consent. They were then asked to nominate children in their class based on the eligibility criteria. Nominations were de-identified by each school, then reviewed by the principal researcher to ensure concordance with eligibility criteria. Following this, schools sent an invitation to participate to parents/guardians, and parent meetings were held to provide information and the opportunity to ask questions. Where consent was provided children were screened using the Strengths and Difficulties Questionnaires (SDQ; Goodman, 1999; discussed further below). The aim of screening was to check for clinically elevated levels of mental health difficulties and distress that may require a full diagnostic assessment, as a group-based program such as MBCT-C may not be suitable as a stand-alone therapy for these children (Semple & Lee, 2011).

MBCT-C Program

MBCT-C is adapted from the MBCT program for adults (Segal et al., 2002). Sessions are 90 minutes (instead of two hours), and use shorter practices in line with children's lower attention span. The key practices of "Raisin Mindfulness", mindful breathing, mindful movement, the three-minute breathing space, and the body scan, are all included (although shortened). In the place of the longer adult meditations are interactive practices involving the five senses (for example, mindful eating, touch and so forth). The interactive practices are intended to be engaging, but their ultimate aim is to teach present-moment awareness. The recommended group size is six children with one facilitator, or up to 12 children with two facilitators.

The MBCT-C program (Semple & Lee, 2011) includes 12 sessions over 12 weeks, which does not fit with the Australian school term of 9-10 weeks, and is longer than most psychosocial interventions used in Australia (typically 8-10 weeks in length).

As such, revisions to the program were required. In our research we reduced MBCT-C to 11 sessions by removing Session 6 ("Sound Expressions"), which has a high degree of overlap in content and objectives for Session 5 ("Music to Our Ears"). Correspondence with one of the authors of MBCT-C (R. J. Semple, personal communication, October 10, 2012) confirmed this amendment to be sensible, given the time constraints faced. Session content summaries are available in Semple and Lee (2011). In some weeks, two sessions were held, so that the entire 11-session program could be completed in a 9-week period. For one school, Session 3 was not completed due to other unavoidable school commitments. MBCT-C includes daily practices for children to complete at home, usually for about three minutes per activity, three times per day. Parents/guardians are invited to assist children with home practices.

Sessions were conducted during school time in non-teaching rooms (an Out of School Hours Care room, and the school hall). Separate groups were held for children with externalizing or internalizing difficulties for two reasons. Firstly, it was anticipated that it would be easier to meet each child's needs within a group experiencing similar difficulties. Secondly, because of concerns that if the groups were mixed, the very shy or quiet children may not find it easy to share their experiences during practice inquiries. Groups were co-facilitated. One facilitator had general registration as a Psychologist, and the second had provisional registration as a Psychologist, with the Australian Health Practitioner Regulation Agency (AHPRA). Facilitators received instruction in MBCT-C from an experienced MBCT practitioner. They were supervised by two senior academic clinical psychologists and received clinical experience credit towards their Masters in Clinical Psychology.

Program standardization. Facilitators were instructed to adhere to the program manual and not tailor or adapt the content. The MBCT-C protocol contains instructions for each session, including "key points" and "therapy goals and essential questions". In addition to their usual preparation for each session, facilitators were specifically instructed to revisit these points immediately prior to commencement of each individual

group. The two supervisors each attended two groups (independently), to observe and assess the facilitators' program delivery and adherence to the manual, however their perception of facilitator's performance was not quantified.

Measurement of Outcomes

As the primary aim was to assess feasibility and acceptability, a mixed methods approach was selected with qualitative methods being dominant. Quantitative measures were also taken at pre- and post-intervention, in a within-subjects (no control) design.

Qualitative data. All children, teachers, school principals, and a random selection of parents were invited to participate in an interview following MBCT-C. Interviews were semi-structured, conducted by the principal researcher. Questions were based on the research hypotheses and were similar for each participant group. Other data included open-ended survey questions, participant feedback recorded in field notes, and other research notes.

Quantitative measures. Measures appropriate for non-clinical populations were selected. All children completed the measures at school, in pairs or individually, under supervision of the principal researcher. Self-report measures were "paper and pencil". The computerized objective attention tests were completed on one laptop. Measures were completed pre- and post-participation in MBCT-C. Program evaluations were completed at post-participation.

Mindfulness. The *Child and Adolescent Mindfulness Measure* (CAMM; Greco et al., 2011) was validated with children from the age of nine. The CAMM is a 10-item single-factor measure, reflecting awareness of ongoing activity as well as judgmental or avoidant responses to thoughts and feelings (a mix of "acting with awareness" and "awareness of judgment"). The psychometric properties of the CAMM are adequate, with Cronbach's α=.81 (Greco et al., 2011).

Mental health difficulties. The *Revised Child Anxiety and Depression Scale* (RCADS; Ebesutani et al., 2012) is a 25-item self-report measure of anxiety (RCADS-A) and depression (RCADS-D) in children. It has established validity and reliability for both

the anxiety and depression subscales, for children from age 8-17. The anxiety and depression sub-scales were found to discriminate effectively between clinical and healthy samples, with reliability coefficients ranging from .71 to .96 (Ebesutani et al., 2012).

The *SDQ* (Goodman, 1999) is a 25-item behavioral screening questionnaire. Four sub-scales (emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems) combine in a total difficulties scale. A fifth sub-scale is prosocial behavior. An Australian normative study found that the 11-14 self-report version was reliable for children as young as seven years (Mellor, 2005), for this reason the 11-14 version was used, including parent (P-SDQ), teacher (T-SDQ), and child (C-SDQ) forms. The SDQ has well-established psychometric properties, with coefficient α ranging from .66 to .80, test re-test correlations from .61 to .77, and concurrent validity established with clinical diagnoses (Mellor, 2005).

Attention. The *Attention Control Scale* (ACS; Muris, Mayer, et al., 2008) is a 20-item self-report measure of a regulative trait referring to the ability to focus, sustain, and shift attention at will. It is valid for children aged 9-13, with adequate validity and reliability (Cronbach's α ranging from .70 to .81; Muris, Mayer, et al., 2008). The *CNS Vital Signs* (CNSVS; Gualtieri & Johnson, 2006b) *Shifting Attention Test (SAT)* and *Continuous Performance Test (CPT)* are objective tests of switching (SAT) and sustained (CPT) attention. They are computerized versions of well-established attention measures. Norms are available for children aged seven and older. Sub-scales include a "domain" score (SAT-Domain and CPT-Domain; correct responses minus errors), and reaction time for correct responses (SAT-RT and CPT-RT). Test-retest reliability is similar to non-computerized versions of the same tests (SAT sub-scales scores ranged from .69 to .80; CPT from .45 to .87). The CNSVS tests have inbuilt validity indicators designed to detect problems such as misunderstanding of instructions, or presence of clinical condition requiring further examination. Invalid test scores are removed prior to conducting change analyses according to the test publisher's instructions (Gualtieri & Boyd, 2009).

Mental health strengths. *The Brief Multidimensional Students' Life Satisfaction Scale* (BMSLSS; Huebner, Seligson, Valois, & Suldo, 2006) is a 5-item measure of satisfaction with life (a proxy for happiness), with established reliability and validity for children aged 8-18. Cronbach's α was found to be between .72 to .86, and a test-retest correlation of $r(359)=.71$, $p<.001$ over a one-month period (Huebner et al., 2006). The *Youth Life Orientation Test* (YLOT; Ey et al., 2005) is a 12-item self-report measure of optimism and pessimism (aspects of resilience), with established validity and reliability for children aged 8-12 (intra-class correlation coefficients .65 to .75; test-retest correlations .45 to .70; Ey et al., 2005). The *Children's Hope Scale* (CHS; Snyder, Hoza, Pelham, & Rapoff, 1997) is a 6-item measure of hope, another aspect of resilience, with established reliability and validity for children aged 4-17 years: Cronbach's α between 72 to .86, test-retest correlation coefficients between .71 to .73 (Snyder et al., 1997).

Program evaluation. All participants were invited to complete an evaluation survey (Semple & Lee, 2011), comprising 10 items with responses on a 1-5 point Likert-style scale. Questions included perceptions of the helpfulness of the program, and whether the program has led to: less worry, better management of anger, more positive interactions, being more patient, helping at school, helping at home, and whether mindfulness practice will be continued. There are also six open-ended responses asking about the most/least helpful aspects of the program, most/least helpful practices, and feelings about the program. The children's evaluation survey also asks for ratings of each individual mindfulness practice, on a 1-5 scale (not at all helpful, to very helpful).

Fidelity measures. Children's attendance was recorded by facilitators. A "completer" attendance threshold of eight out of 11 sessions was set, slightly more conservative than the MBCT-C validation study (eight out of 12 sessions; Semple & Lee, 2011).

Facilitator session feedback survey. After every session, facilitators each completed a session feedback survey, rating (on a 1-5 scale) their own level of preparedness, the children's reaction to the content, their opinion on whether the content

was sufficient/too much for 90 minutes, and perception of what the children said about their level of home practice. Facilitators were also asked to record anything that occurred in-session that impacted on program delivery, or anything else they thought was relevant, within an open-ended question.

Rationale for Sample Size

A maximum number of (*n*=48) participating children was set, based on two factors: the upper limit of 12 children per group, assuming availability of two co-facilitators (Semple & Lee, 2011); and the school principal's recommendation that two groups for each school would be feasible. A lower limit was not set.

Allocation to Groups

Within each school, the "internalizing" or "externalizing" difficulties nomination was used to form two clusters. Within these clusters, children were ranked by age, and divided into two groups. Where numbers were uneven, the mid-ranked child was allocated to the group that best matched their age or year level.

Data Analyses

Qualitative analysis. Thematic analysis (Braun & Clarke, 2013) was used to analyze all qualitative data. Transcription was completed by the principal researcher and a research assistant using orthographic transcription (a focus on transcribing spoken words and other sounds; Braun & Clarke, 2013), then combined with field notes and open-ended responses from feedback forms. Transcript accuracy was checked against the recordings by the principal researcher. The thematic analysis was conducted by the principal researcher, including complete coding (to identify anything of relevance to the research questions) using NVivo 10 for Windows. The approach combined deductive (looking for answers to the hypotheses) and inductive (coding data that might fall outside of the hypotheses) methods. A second coder was not utilized, as according to Braun and Clarke's (2013) method, thematic analysis is an active process, whereby meaning is actively constructed from the data. Coding and themes were discussed regularly within the research team throughout analysis. As there was a delay between data collection and

analysis, member checking was not feasible. To help address this, the research assistant (who assisted with transcription) also reviewed the final themes and quantitative results, checking for inconsistencies and inaccuracies. Furthermore, the research team also includes the two supervisors of the facilitators, who assisted in identifying any inconsistencies, misinterpretations or missed topics.

Quantitative analyses. In line with guidance for conducting pilot studies in preparation for a RCT (Lancaster, 2015), 95% confidence intervals were calculated for the mean difference between pre- to post-intervention measures, using paired-samples *t* tests without correction for multiple comparisons. The effect size selected was Cohen's *d* (small = 0.2, medium = 0.5, and large = 0.8; Cohen, 1992). This provides an understanding of the expected direction and estimated magnitude of effects (not an evaluation of effectiveness). Evaluation forms were reviewed using descriptive statistics. During planning it was expected that analyses would be conducted for the whole sample, for children with internalizing and externalizing difficulties. However, as the number of enrolled children with externalizing difficulties was very low, analysis for this sub-group was not progressed. Analysis for the group of children with internalizing difficulties was retained, as results were of interest for planning the future RCT.

Results

Recruitment took place in Term 1 of 2013 (February to April), and the MBCT-C sessions were held in Term 2 (April-June 2013). Pre-intervention measures were completed one week prior to the MBCT-C sessions commencing, and post-intervention measures within one week of the sessions finishing. Interviews were completed within three weeks following completion of the MBCT-C program, with the exception of the two school principal's interviews, which were conducted two months after the program had ended.

Participant Flow

A participant flow diagram is outlined in Figure 1 (page 40). All children nominated by teachers met the inclusion criteria. The number of eligible nominated

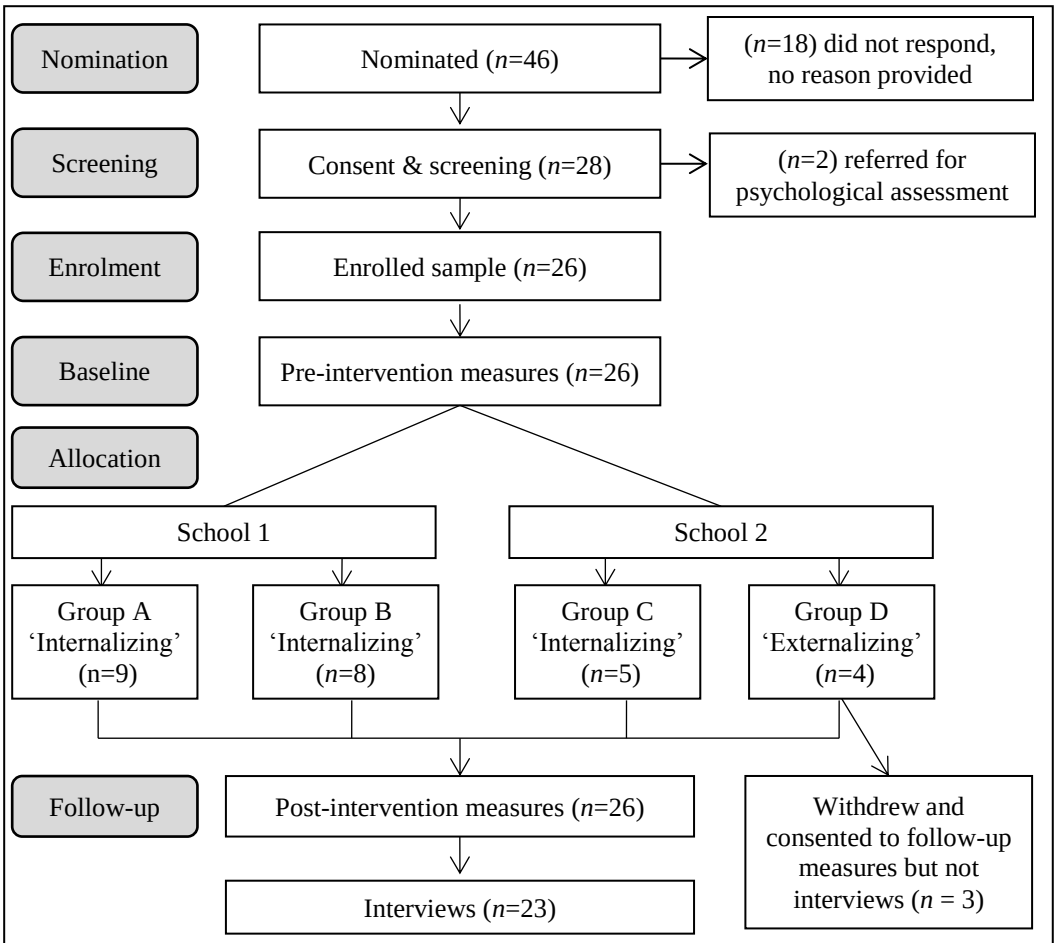

Figure 1. Participant Flow Diagram

children was slightly greater than the maximum set, but invitations were sent to parents/guardians of all nominated children, on the school's advice that it was unlikely that all parents would respond. All teachers involved attended the teacher's information session. Eight parents attended the initial parent's meeting, and four attended the final meeting.

Within the nominated group, 10 children were classified as experiencing externalizing difficulties (*n*=5 per school) and four parents/guardians provided consent (response rate 40%). For children with internalizing difficulties the consent rate was 67%. Within School 1, all enrolled children were within the "internalizing" criterion and therefore divided into two groups. Within School 2, (*n*=4) male children met the "externalizing" criteria, and were placed in one group. The remainder of children at this school (*n*=5) were placed together in a second group. School principals indicated that

each of the final groups had acceptable balance of maturity and gender, and there were no known friendship problems. Descriptive statistics are provided in Table 1 (page 32), for each group, the overall sample, and for all children experiencing internalizing difficulties.

During screening, the SDQ data for two children suggested that they were experiencing clinically elevated symptoms of mental health difficulties and distress. Their parents were contacted, it was decided that they would seek assistance through their General Practitioner, and they did not participate. Within the first 2-3 sessions, three children in the "externalizing" group withdrew from MBCT-C, although they agreed to complete the post-participation measures. The remaining child from this group continued participation on his own until the last two sessions when he joined the other group in his school. There were no other withdrawals.

Fidelity

Overall, the MBCT-C program was implemented as intended, although there were some deviations which should be noted when considering the results (Feagans Gould, Dariotis, Greenberg, & Mendelson, 2016). A "Mindful Space" was achievable in most but not all sessions. In two sessions, other students entered the group space e.g. to collect material from a printer or because of a double-booking. This occurred in one "younger" group, (where it was noted that it was hard for the children to maintain a mindful presence), and one "older" group, where it appeared to unsettle the children for the remainder of that session (around 20 minutes) only. The facilitators took steps to prevent interruptions, but in a school environment it was difficult to fully control this.

Home practice was only reported on record forms by a small number of children. Facilitators did not enforce the written home practice sheets, in part because of concerns about literacy for some children (whom they did not want to "single out"), but also because most children lost the handouts each week. Home practice was generally reported verbally, and is discussed further in the qualitative themes below. The "feely faces" scale from the program manual was used, but not consistently by all children e.g. some

children marked the wrong session, and some did not make a mark for either the beginning or end of a session for reasons that are not known.

Although the manual suggests that the sessions are not observed by others, the two school principals requested to observe part of a session. As mindfulness was new to both school communities, this request was considered an appropriate way for the school principals to assess acceptability, and was granted: they each participated in part of two sessions, for around 15 minutes. The facilitators reported that the children appeared to appreciate their principal's participation, and their responses indicated that it made them (the children) feel important, and this was another source of positive role modelling. Similarly, the children did not appear to be disturbed by the two supervisors' quiet mindful presence when they attended for observation of sessions.

Attendance. Within the overall sample, 20 children met the completer status (77%), 22 children attended at least seven sessions (84%), and 23 attended at least six sessions (88%). For the group of children with internalizing difficulties, at least 19 children attended eight sessions (86%), 21 attended at least seven sessions (95%), and all children attended at least six sessions. As noted above, in School 1, Session 3 was cancelled.

Qualitative Analysis and Themes

A total of 41 interviews were completed, including children (*n*=23), school principals (*n*=2), a student support officer (*n*=1), teachers (*n*=5), parents (*n*=8), and facilitators (*n*=2). The student support officer was involved in coordination of the program and therefore was included within the interview invitations. The parents/guardians of the three children who withdrew were sent a letter, inviting both parent and child to participate in an interview; no response was received. Of the nine teachers involved, four did not respond to the invitation to be interviewed. A random selection of 10 parent/guardians were invited to attend an interview: five provided consent and five declined, did not respond, or could not find a suitable time to be

interviewed. A further five were randomly selected and of these, three provided consent and were interviewed, at which point saturation had occurred and the process was ceased.

Nine themes were identified, discussed in detail below, and a summary of these themes is provided in Table 2 (page 44). Where quotations are provided, punctuation is used only to indicate pauses, and grammar has not been corrected. This is in line with Braun and Clarke's (2013) instructions for orthographic transcription.

Everything about this felt different. The children felt that the groups were "a bit weird" to begin with. It was a daunting experience for some, as they weren't sure what they were supposed to do and it took a little time to adjust and understand that they weren't being graded. The adjustment was made easier by the facilitators' accepting and understanding stance, nothing was ever "wrong", and everyone's contribution was made to feel valued.

> *"when I actually got in there, um, the people that were there, they seemed really welcoming kind of, very homely people. And they were very kind to, all of us, and all feedback was good. So when we did the first home practice it kind of, like, 'cos we all explained what we had done, and they just praised it all, and they didn't put it down, because, nothing was wrong"* ***[Participant #6, female, age 10]***

The group dynamic was positive and new friendships were formed. The school principals described seeing the children learning in a way that they had not seen before. Using a non-teaching room helped to create a "different" environment. Interruptions by other students sometimes made it hard to hold a mindful presence. These were either where a MBCT-C participant interrupted or distracted others (e.g. by giggling), or where a non-participating student entered the group space for a reason not related to this program.

Table 2

Summary of Qualitative Themes

Theme	Description
Everything about this felt different	MBCT-C felt different to any kind of program run previously
MBCT-C content was accepted	MBCT-C was accepted and liked by most children, particularly the interactive activities
Barriers to involvement	Involving parents is challenging in this setting. Children's motivation was affected by what they might miss out on.
Developing skills outside of group time	A few children practiced regularly and appeared to benefit from it. Mindful breathing was the most commonly reported practice.
Changes observed in the children	Wide-ranging changes were observed, including better management of difficult emotions, improved attention, and even "transformational" change. Facilitators noticed children "getting" or understanding mindfulness at different stages.
Breathing is the cornerstone	The children who engaged with "the breathing" were the ones who appeared to benefit most
Modelling is an important part of learning	In this setting, modelling by all adults involved is important, including modelling of the importance of participation.
The end result is what happens in the classroom	Helping children manage emotional difficulties can lead to more effective classroom learning, which leads to better outcomes
Reasons for withdrawal	With additional support the children who withdrew may have been able to participate in the full program

Acceptability of MBCT-C content. Overall, the program was viewed positively. School staff reported that the children were happy to go to their mindfulness groups and returned to class in a positive mood. The children reported enjoying the program. Their opinions on some of the specific activities were quite polarized (e.g. Yoga exercises). Facilitators reported that the suggested activity timings were too long, particularly mindfulness of the body. They also reported a high degree of confusion about many of the poems, which they felt were too abstract for these children. Contrary to this, during the interviews the poetry was reported (spontaneously) by a few children as something they liked. The party and graduation ceremony were greatly enjoyed, and parents and school staff thought it a good way to mark the program's conclusion. Several of the teachers involved had been trained in positive psychology. Others knew about positive psychology through the school's involvement in activities in the region. It is likely that this meant that teachers accepted the mindfulness program fairly readily. Most parents and some children expressed a desire to continue with mindfulness practice, or to repeat the program in the school.

Barriers to engaging participants. There is a spectrum of parental involvement in school life, which meant that some children had greater support at home (to engage in the program) than others. Barriers to enrolment in the program included this spectrum of involvement (i.e. some parents did not respond), and also a concern that a child might be stigmatized. Concerns about stigmatization were also raised by the research team, however the school staff unanimously reported that children coming and going from classrooms is normal (for remedial learning programs, music lessons etc.) and there were no reports of teasing during the program. In School 1, having a central coordinator helped the program run smoothly (and aided attendance). Some children did not want to miss a favorite class activity (e.g. outdoor sport) and this affected their motivation, although other children preferred to miss that same activity in favor of their mindfulness group.

Developing skills outside of group time. Overall, only a moderate level of home practice was reported and it was not done regularly. A small number of children

demonstrated enthusiasm for home practice and appeared to achieve greater benefit from this. If a child had enjoyed an interactive activity they were more likely to conduct this practice at home. The spectrum of parental involvement (discussed above) meant there was variation in support for home practices. The facilitators felt that the program could benefit by allocating greater time to setting and reviewing home practice and overcoming barriers. Handouts were liked, but the system of using a folder to take handouts home each week wasn't successful (most children lost the handouts). Some children didn't want to write on the sheets because they didn't know if they were "doing it right". Most parents and teachers expressed a desire to know more about the program so that they could help their child, although this was said with a caveat that everyone's lives are busy. During the weeks where two MBCT-C sessions were run, the facilitators felt that there was not sufficient time between sessions for the new concepts to "settle" within the children (i.e. the children needed more than just two or three days between sessions for the latest practices and concepts to have effect).

Changes observed in the children. Wide-ranging changes were reported, although not for all children. Changes reported by children included improved attention and schoolwork, awareness of emotions, better management of difficult emotions, improved relationships with others (including better awareness of unhelpful friendships), increased self-awareness, awareness of judging, and an understanding that "thoughts aren't facts".

"I used to say that I couldn't do it. but thoughts and feelings aren't facts"

[participant #12, female, age 10]

"well, it made me concentrate a bit more" ***[participant #13, female, age 9]***

Improvements reported by parents included children being happier to go to school, feeling less anxious, and being able to leave past difficulties behind them. One child's parent reported that he was now eating a wider variety of food, and others talked about dinner time being less of a battle. A few parents noted that their child's academic performance had improved.

Although most of the above noted changes were reported across participant groupings, they were talked about in different ways. Children talked about internal experiences such as feeling calmer, realizing that "thoughts aren't facts", and sometimes "fighting less" with siblings, whereas parents and teachers talked about behavioral improvements. Some parents described their children being happier and more confident in themselves. Although there were different emphases in the description of change between participants groups, there were no conflicting reports. Facilitators also described seeing changes in children within the group sessions, an example being where a child initially became upset when asked to wait her turn, and the facilitator invited her to sit with the emotions she was experiencing for a minute. The child calmed, and positively participated for the rest of the session, whereas in earlier groups she may not have recovered in this way.

The degree of change varied from a sense that "I've seen a change but it may or may not be due to mindfulness", through to "transformational" change. The "transformational change" occurred in a small number of children who were facing significant emotional difficulties. School staff reported that these children not only reduced "negative" behaviors (such as anger outbursts and peer-problems), but developed new, positive ways of interacting with others, and a desire to share what they had learned with other children. This was seen as surprising, given the degree of difficulty that these children faced in their daily lives.

> *"he's the most engaged I have ever seen him. What, we haven't- we haven't needed to deal with any issues around anger management or violence or being out of control, if anything completely the opposite, also very, wanting to engage with people communicate to people in effective forms, asking questions, being a lot more curious, talking about how he would do, solve a problem if he had one to do with this or, and you know, just letting go of the past"* ***[School Principal #2]***

During the program, the facilitators described a sense that "you could see the penny drop". That is, at some stage, during a particular activity a child would all of a

sudden "get it", and from that point onwards would be fully engaged with the program. This occurred at different times for different children (and for some it did not occur), but once it did, the child would bring a new level of presence to the sessions. For this reason, the facilitators thought that it is important to "trust the program" and see what unfolds.

Some of the children reported being able to bring attention to the present moment, for example noticing bodily sensations or emotions, or to focus when needed (e.g. in a critical time during a sporting event). Several children used the term "automatic pilot" and described the process of noticing this and shifting their attention back to what they were doing. In their description of the mindfulness practices and activities, none of the children mentioned "noticing" their emotional or cognitive reactions (even when prompted), although many talked about experiencing their five senses in a way that they never had before (for example, slowing down eating, noticing smells). Many children described the phrases "thoughts aren't facts" and "feelings aren't facts" as being important learnings. One child articulated an advanced awareness of the processes of mindfulness. This is illustrated in the following two quotes **(participant #6, female, age 11)**.

> *".. and we were all just aware of feelings, and, letting them go, and... do as they please"*
>
> *"our feelings, like, we judge things bad or good, and everyone like I'll look at that and I'll be 'is that bad or good?' in my mind. and like, I'll look at something else and it'll be the same thing. but, in the mindfulness program we may think it's bad, but everything... all things are the same, like good or bad, it's just the same, it's just the reaction that our human minds have"*

Breathing is the cornerstone of the program. On the whole, mindful breathing was described by most children as something enjoyable or useful. It was a technique often used in everyday life, for example before an anxiety-provoking event such as a test, to relax, to settle emotions, or practiced regularly because it was seen as beneficial. Most children used the term "three-minute breathing" or called it "the breathing". A small

number of the children said that they could not "get into" the breathing or disliked it. The children who did not engage with the breathing tended to be those who didn't really engage with the program overall – either because they just never "got into" the program, or because of a higher number of absences. Several of the parents interviewed provided examples where their child had used mindful breathing in stressful situations. The school principals had practiced mindful breathing when participating/observing in two sessions, and described examples of prompting children to use it.

Modelling is an important part of learning. According to MBCT-C theory, children learn in a large way through observation of the mindful presence of the facilitator, and one facilitator spontaneously described how her daily mindfulness practice helped her to cultivate the ability to sit comfortably with silence during the practice inquiries, and provide time for a child to respond, without interrupting or feeling a need to "rescue" them. Modelling by teachers was also a strong theme, for example providing flexibility in lesson plans so that a child didn't need to worry about missing a test (or favorite activity). This helped to show the child that their teacher believed their participation was worthwhile. Naturally, children's parents are another important source of modelling in their lives, and although this is discussed in the MBCT-C protocol, it was less talked about during the interviews.

The end result is what happens in the classroom. Parents and school staff noted that children come from all sorts of backgrounds and are dealing with all kinds of difficult situations and emotions, from trauma, to bullying, to anxiety. Often these emotional difficulties mean that a child is not able to focus in the classroom. The school staff felt that if MBCT-C could help children to understand and handle their emotions, and therefore allow them to learn in the classroom, it was well worth the investment in time. Related to this, it was evident throughout all interviews (although not explicitly stated) that parents and school staff believed that school is an appropriate setting for social and emotional learning. The school staff reflected a sense that a child's development in their school is broader than pure academic skills, that the school can play

an active role in helping them socially and emotionally if needed. There was a feeling of genuine care and concern for each child's current and future wellbeing.

Reasons for withdrawal. At the time of their withdrawal, the three children with externalizing difficulties simply said that they did not want to participate any more. The facilitators noted that during sessions, each of the children was able to engage with the program content for brief periods, but their observation was that factors outside of the group space impacted on their ability to focus. One example was that the facilitators perceived that a schoolyard fight had preceded the third session, although the children were highly reluctant to talk about it. Feedback from the school staff was that there was no issue with the program content, and with additional support it may have been possible to motivate these children to participate. Their school principal noted that with a different classroom teacher in their previous school year, the children participated in brief meditation practices after lunch time, and had engaged in these practices. During the research period it was not possible for their classroom teacher to participate in the MBCT-C program, as they had ongoing classroom teaching responsibilities. However, the school principal suggested that if their classroom teacher could participate in MBCT-C with them, and help them practice between group sessions, it would have provided both a strong role model for them to follow, as well as the opportunity for further practice.

Feedback for the child from the externalizing group who remained in MBCT-C indicated that he fully engaged with the program content, enjoyed it and was able to express himself freely (including not feeling embarrassed during mindful movement or yoga). The facilitators reported finding it easy to adapt the material for one child, and felt that he benefited from having focused support. The child reported that when joining with other children for the last sessions it was a little harder to maintain a mindful presence when others became distracted (e.g. wriggling or giggling). However, the party was much more enjoyable as a group.

Analysis of Quantitative Measures

Response rates at pre-intervention were 100% (all participants) except the YLOT which one child did not complete at pre-intervention, and this was not detected until a later date. Children's response rates at post-intervention were 100%, except for evaluation surveys (88%, *n*=23). Post-intervention response rates for parents were 54% for P-SDQ (*n*=14), and 50% for evaluation surveys (*n*=13). For teachers the rates were 31% for the T-SDQ (*n*=8), and 44% for evaluation surveys (*n*=4). Table 3 (page 52) shows baseline and post-intervention data, and Cohen's *d*, for the group of children with internalizing difficulties, and the whole sample. A table of *t* test results including 95% confidence intervals is provided in Supplement 1, Table S. 2 (page 60). At post-intervention there was no P-SDQ or T-SDQ data for the children with externalizing difficulties, therefore the descriptive statistics and *t* test results for both samples are the same. Furthermore, as response rates were low for the P-SDQ and T-SDQ, the *t* test results are tabled, but should be treated with caution. For mental health difficulties there was a small improvement in the RCADS-A, and small to moderate improvement for the RCADS-D. For mental health strengths there was a small increase in the CHS for children with internalizing difficulties (a trivial effect for the whole sample), and negligible effects for both the BMSLSS and YLOT. For mindfulness there was a small increase. For attention there was a moderate increase for the self-report ACS, a large improvement for the SAT-Domain score for children with internalizing difficulties (moderate-large for the whole sample), small improvement for the CPT-Domain score, and very small improvements for both CPT and SAT reaction times. There was no change in the C-SDQ Total Difficulties sub-scale, and a small increase for the C-SDQ Prosocial sub-scale.

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Table 3

Mean (and Standard Deviation) at Pre- and Post-Intervention

	Children with Internalizing Difficulties					All Children				
Measure	Pre [a]		Post [b]		*d*	Pre [c]		Post [d]		*d*
ACS	28.51	(9.08)	33.18	(9.53)	0.50	28.13	(8.94)	32.42	(9.32)	0.47
BMSLSS	28.18	(5.98)	27.77	(5.73)	-0.07	27.81	(5.94)	27.15	(5.70)	-0.11
CAMM	33.64	(8.63)	35.61	(6.54)	0.26	34.50	(9.37)	36.52	(7.20)	0.24
CHS	21.27	(6.71)	22.91	(7.52)	0.23	21.23	(6.53)	21.73	(7.74)	0.07
RCADS-A	11.98	(6.89)	9.82	(6.30)	-0.33	12.23	(6.67)	9.89	(6.52)	-0.36
RCADS-D	9.43	(5.81)	7.10	(4.84)	-0.44	9.71	(6.07)	7.20	(5.06)	-0.45
YLOT	22.52	(8.04)	22.89	(6.61)	0.06	22.04	(7.86)	21.60	(7.43)	-0.06
SAT-Domain	21.28	(11.60)	31.11	(12.45)	0.82	20.80	(11.49)	28.55	(13.80)	0.66
SAT-RT	1145.00	(215.84)	1100.50	(258.28)	-0.19	1,118.15	(223.30)	1,067.78	(277.26)	-0.30
CPT-Domain	30.10	(7.92)	32.50	(9.26)	0.28	30.39	(7.46)	31.09	(9.21)	0.08
CPT-RT	507.50	(50.05)	501.11	(43.81)	-0.14	496.43	(55.43)	498.91	(44.73)	0.14
SDQ Total Difficulties										
Child	14.77	(7.14)	14.86	(8.08)	0.01	15.27	(6.99)	14.96	(7.58)	-0.04
Parent	14.91	(6.49)	12.07	(6.89)	-0.32	15.46	(6.36)	^	^	^
Teacher	11.50	(7.53)	11.25	(8.10)	-0.09	12.54	(7.45)	^	^	^

Table continues

Table 3 continued

	Children with Internalizing Difficulties					All Children				
Measure	Pre [a]		Post [b]		*d*	Pre [c]		Post [d]		*d*
SDQ Prosocial										
Child	8.55	(1.37)	8.05	(1.84)	-0.31	8.31	(1.64)	7.88	(1.93)	-0.24
Parent	7.86	(2.03)	7.93	(1.73)	0.26	7.81	(2.04)	^	^	^
Teacher	7.50	(2.37)	6.88	(2.85)	-0.04	7.35	(2.24)	^	^	^

Note: ACS=Attention Control Scale; BMSLSS=Brief Multidimensional Students' Life Satisfaction Scale; CAMM=Child and Adolescent Mindfulness Measure; CHS=Children's Hope Scale; RCADS=Revised Child Anxiety and Depression Scale (RCADS-A=Anxiety; RCADS-D =Depression subscale); YLOT=Youth Life Orientation Test; SAT-Domain=Shifting Attention Test Domain score; SAT-RT=Shifting Attention Test reaction time, correct responses (ms); CPT-Domain=Continuous Performance Test domain score; CPT-RT=Continuous Performance Test reaction time, correct responses (ms).

[a] (*n*=22) for all except YLOT (*n*=21), SAT (*n*=18), and CPT subscales (*n*=20)

[b] (*n*=22) for all except SAT (*n*=18), CPT (*n*=18), Parent SDQ (*n*=14), and Teacher SDQ sub-scales (*n*=8)

[c] (*n*=26) for all except YLOT (*n*=25), SAT (*n*=20), and CPT subscales (*n*=23)

[d] (*n*=26) for all except SAT (*n*=22), CPT (*n*=22), Parent SDQ (*n*=14), and Teacher SDQ subscales (*n*=8)

^. No Teacher or Parent SDQ forms for children with externalizing difficulties were returned at post-intervention, therefore data for the whole sample is equal to the data for children with internalizing difficulties.

Supplement 1, Table S. 2 (page 62) displays descriptive statistics for program evaluation scores. Overall the children rated the program as helpful to very helpful. Their ratings suggest that the program helped them to be less worried/anxious, better able to manage their anger, be more patient and so forth. Parent and teacher mean ratings were generally lower than the children's, reflecting a positive view of the program, although ratings were closer to "not sure". The exception was "better able to manage anger", which was rated slightly below "not sure" by parents. Supplement 1, Table S.3 (page 63) displays children's ratings of specific MBCT-C activities, which were positive overall, although with wide-ranging responses.

Discussion

Overall, the qualitative and quantitative results converged in support of the three hypotheses. The MBCT-C program was found to be feasible and acceptable in an Australian school setting (in fact, it was generally well-liked), and there is promising initial evidence for improvements in attention and internalizing difficulties. The use of multiple informants (children, teachers, and parents) across both qualitative and quantitative analyses has provided greater depth in the findings than is usual in a pilot test. These results are likely to be of interest to practitioners and researchers, as MBCT-C not only was found to be relevant in a different (albeit Western) culture, but it succeeded in a school setting. In addition, the initial evidence suggests that the program appears to be working in accordance with its theory, as there were improvements in the children's attention, and the pattern of results fit well with the BPM (Grabovac et al., 2011), discussed below.

Feasibility and acceptability were demonstrated in the interviews, program evaluation, and activity feedback forms, and overall, results were consistent across all three. Children generally liked the program, expressed a wish to continue with it, and rated it as "very helpful" on their evaluation forms. Although there were variations in children's enjoyment of, and engagement in, specific activities within the MBCT-C

program, there were none that were universally rejected/disliked. Evaluation ratings by parents and teachers were lower than children's, with mean scores closer to the rating of "not sure". Intuitively this might be expected, given that parents and teachers did not personally participate in MBCT-C; however, this also fits with the qualitative finding that they wished to know more about what was happening in the program. Enabling better communication between facilitators, parents and teachers is a challenge, given the finding that there is a spectrum of parental involvement in school life, and that parents and teachers are busy and do not want to be overloaded with information. Nevertheless, with greater parental support and modelling it is likely that children would engage in more home practice. It is also of interest that, despite the additional challenges posed by running MBCT-C in a school setting, the overall results were encouraging

Improvements in mental health strengths and difficulties was the second concern in this pilot test, and the results are promising. The children's qualitative reports of feeling calmer, using breathing to reduce emotional distress or worry (and generally feeling happier) were accompanied by a small change in mindfulness, and small to moderate improvements in anxiety and depression. There was also an indication from the Parent SDQ that Total Difficulties improved, although numbers were low and it is possible that this result is biased by the low response rates post-intervention; i.e. it may be that those parents with a positive experience of the program were more likely to respond.

One key contribution of our study is the evidence that, in children, attention may improve through mindfulness training. Whereas previous studies in this area have typically only used one quantitative measure of attention, our results provide a similar pattern across qualitative and quantitative data, for multiple informants. School principals and teachers described children's improved ability to pay attention at school, which was supported by children's verbal reports of improved attentional abilities (particularly noticing being on "automatic pilot", and being able to concentrate more). This was also consistent with improvements in the self-report measure of attention

control, and objective test of shifting attention. The pattern of results discussed here suggest that children were able to notice being in "automatic pilot", then shift attention to the present moment, and this might explain the results for both the attention control measure (attention regulation) and shifting attention test.

The pattern of qualitative and quantitative results also fits with the BPM (Grabovac et al., 2011). In terms of developing awareness (stage one), MBCT-C helped many children to identify and label thoughts and emotions, and in interviews they described having better self-awareness. Development of attention regulation (stage two) was evidenced by qualitative reports of noticing automatic pilot, and the improved self-reported attention control, and switching attention. In the BPM, insight (the third stage), refers to a "direct, non-conceptual understanding" of the fleeting nature of thoughts and emotions, which leads to a deep and long-lasting change in the relationship with one's thoughts and emotions (Dorjee, 2010, as cited in Grabovac et al., 2011, p. 159), and in our research it remains less clear whether this was reached by any children. On a conceptual level it appears possible that some children may have experienced insight, as evidenced by quotes within the "Changes observed in the children" theme (e.g. understanding that thoughts and feelings aren't facts, awareness of judgments, and noticing feelings then letting them go), and these changes may have led to the improvements in mental health difficulties discussed above. However, the model also states that a reduction in emotional distress may also occur on a short-term basis, as a result of using attention regulation to switch attention away from maladaptive thought processes (for example, switching attention from one's thoughts to one's breath). Therefore, it is difficult to determine whether the emotional benefits seen in this study were the result of the use of attention regulation in mindfulness, or the development of insight. In fact, it is likely to be difficult to measure insight in children of this age, given the natural limits to their development of language capabilities.

Given the wide-ranging improvements reported in the interviews, the children's reports of feeling happier, parent reports of less arguments at home, and principals

reports of children's moods improving, it was surprising that no change was seen on the measure of optimism (the YLOT) and satisfaction with life (BMSLSS). The YLOT scores fell only slightly below the middle-ranges of the normative sample scores (Ey et al., 2005), and as such it does not appear that floor or ceiling effects impeded these measures. Similarly the BMSLSS mean scores were also similar to, but slightly lower than those within the validation sample (Huebner et al., 2006). Possible explanations include there being no effect of MBCT-C on these constructs, or that the measures were not sensitive to change (e.g. perhaps due to cross-cultural differences, as the measures were validated in the USA). However, the results are consistent with a review of MBIs with children, which found that effect sizes tend to be weaker for improvement in positive psychology measures, compared to improvements in measures of mental health difficulties (Zoogman et al., 2015).

When considering the changes reported by the children, and the facilitators' descriptions of the changes they observed, it was also surprising that the measure of mindfulness (the CAMM) showed only a small change. Given the reported challenges with understanding and measuring mindfulness in children (Pallozzi et al., 2017), a possible explanation is that the CAMM has limited sensitivity to change in this population. This may be plausible, given that a recent pilot test of MBCT in an adolescent population diagnosed with anxiety found no change between pre- and post-intervention CAMM ratings (Ames, Richardson, Payne, Smith, & Leigh, 2014). However, it is also possible that the process of developing mindfulness skills in children starts with other aspects such as improvements in shifting attention, and that further mindfulness practice could lead to greater change on a measure such as the CAMM.

The results found in our research build on the work of the program's authors. As discussed earlier, in their randomized wait-list trial, Semple and Lee (2011) found a moderate improvement in parent-reported attention, small reduction in behavioral problems, and no reduction in anxiety for the overall group (although clinically significant change was noted for a subset of children). Our findings support their work,

and add several new contributions: a test of MBCT-C in a school environment (a challenging setting), and in a new population (Australian school children). Furthermore, through the combination of qualitative analyses across multiple informants, we have added a rich picture of how these changes were described by participants. To our knowledge, a qualitative analysis has not yet been published for MBCT-C with children of this age.

Running MBCT-C in a school setting provided a number of challenges, and therefore some practical changes could be considered if implemented in schools in the future. Parents and school staff noted that there were barriers to communication between facilitators and parents. Furthermore, parents and teachers would like more information about what the children experience each week, although they also feel time-pressured. As an initial step, a weekly email or newsletter to parents and school staff could be beneficial, as well as encouraging facilitators and parents/guardians to be in contact even if it is difficult to meet in person. A second recommendation is to amend the program's structure, to avoid holding two sessions within one week. The overall program length could be shortened, or split across two school terms. If running the program with children experiencing externalizing difficulties, greater support is likely to be needed from school staff to help the children remain in the program. A final suggestion is that the MBCT-C program does not specify a follow-up booster session (as adult MBSR does). This could be a useful addition, as feedback from participants indicated it would be positively received, and it may help with duration of effects.

The current study was a small pilot test, with no control group. It would be of interest to determine whether the pattern of results seen here is borne out on a larger quantitative analysis with an active control condition, such as an established cognitive behavioral therapy program. It should also be acknowledged that both schools involved in this study had previous (albeit limited) exposure to positive psychology, which is likely to have made it easier for them to accept this "different" program, and this may not be the case in other schools. When considering the results, it should be noted that self-

selection bias may have influenced the findings, as not all parents and teachers were interviewed, and response rates for their post-intervention questionnaires were low. Also, the children experiencing the greatest emotional difficulties (as reported by school staff) were those whose parents were less likely to respond to the invitation to participate in interviews.

This pilot study has demonstrated that MBCT-C is an appropriate intervention for use in an Australian school setting, for children experiencing internalizing difficulties. Furthermore, although a pilot test, the triangulation of qualitative data, across multiple informants, adds weight to the promising evidence of its positive effects on emotional wellbeing and attention. The results are likely to be of interest to schools, practitioners and researchers, not only because of the positive findings, but because of their fit with mindfulness theory. The results also provide a strong rationale for MBCT-C to be tested in a RCT in Australian schools for children experiencing internalizing difficulties, and attention could be tested as a possible mediator of change.

Supplement 1

Table S.1

Change in Children's Measures from Pre- to Post-Intervention

	Children with Internalizing Difficulties							All Children						
Measure	Δ *M*	95% CI		*t*	*p*	*d*	*df*	Δ *M*	95% CI		*t*	*p*	*d*	*df*
ACS	4.67	[1.07,	8.26]	2.70	.01	0.50	21	4.30	[1.26,	7.33]	2.91	.007	0.47	25
BMSLSS	-0.41	[-2.16,	1.34]	-0.49	.63	-0.07	21	-0.65	[-2.25,	0.94]	-0.84	.41	-0.11	25
CAMM	1.97	[-0.70,	4.64]	1.53	.14	0.26	21	2.01	[-0.31,	4.34]	1.78	.09	0.24	25
CHS	1.64	[-1.77,	5.04]	1.00	.33	0.23	21	0.50	[-2.74,	3.74]	0.32	.75	0.07	25
RCADS-A	2.15	[0.18,	4.13]	2.27	.03	-0.33	21	2.34	[0.61,	4.07]	2.79	.01	-0.36	25
RCADS- D	2.34	[0.46,	4.22]	2.59	.02	-0.44	21	2.52	[0.91,	4.12]	3.24	.003	-0.45	25
YLOT	0.41	[-2.42,	3.24]	0.30	.77	0.06	20	-0.46	[-3.15,	2.24]	-0.35	.73	-0.06	24
SAT-Domain	9.06	[5.20,	12.92]	4.97	<.001	0.82	16	8.42	[4.60,	12.24]	4.63	<.001	0.66	18
SAT-RT	-59.80	[-158.77,	39.17]	-1.28	.22	-0.19	16	-78.19	[-178.10,	21.71]	-1.64	.12	-0.30	18
CPT-Domain	1.81	[-1.73,	5.35]	1.09	.29	0.28	15	0.63	[-2.67,	3.94]	0.40	.69	0.08	18
CPT-RT	0.38	[-17.07,	17.82]	0.05	.96	-0.14	15	6.89	[-9.34,	23.13]	0.89	.38	0.14	18

Table continues

Table S.1 continued

	Children with Internalizing Difficulties							All Children						
Measure	Δ *M*	95% CI		*t*	*p*	*d*	*df*	Δ *M*	95% CI		*t*	*p*	*d*	*df*
SDQ Total Difficulties														
Child	0.09	[-1.83,	2.01]	0.10	.92	0.01	21	-0.31	[-1.98,	1.37]	-0.38	.71	-0.04	25
Parent†	-2.07	[-4.66,	0.52]	-1.73	.11	-0.32	13	^	^	^	^	^	^	^
Teacher†	-0.75	[-2.83,	1.33]	-0.85	.42	-0.09	7	^	^	^	^	^	^	^
SDQ Prosocial														
Child	-0.50	[-1.47,	0.47]	-1.07	.30	-0.31	21	-0.42	[-1.29,	0.45]	-1.00	.33	-0.24	25
Parent†	0.50	[-0.37,	1.37]	1.24	.24	0.26	13	^	^	^	^	^	^	^
Teacher†	-0.13	[-0.95,	0.70]	-0.36	.73	-0.04	7	^	^	^	^	^	^	^

Note. Δ *M*=post-intervention mean score minus pre-intervention mean score; ACS=Attention Control Scale; BMSLSS=Brief Multidimensional Students' Life Satisfaction Scale; CAMM=Child and Adolescent Mindfulness Measure; CHS=Children's Hope Scale; RCADS=Revised Child Anxiety and Depression Scale (RCADS-A=Anxiety subscale; RCADS-D=Depression subscale); YLOT=Youth Life Orientation Test; SAT-Domain=Shifting Attention Test Domain score (correct responses minus errors); SAT-RT=Shifting Attention Test reaction time for correct responses (ms); CPT-Domain=Continuous Performance Test domain score (correct responses minus errors); CPT-RT=Continuous Performance Test reaction time for correct responses (ms).

†. Low *n*.

^. No Parent or Teacher SDQ forms were returned at post-intervention for the children with externalizing difficulties, therefore data for the whole sample is equal to the data for children with internalizing difficulties.

Table S. 2

Descriptive Statistics for Program Evaluation Questionnaires

Question	Children (*n*=23)		Parents (*n*=13)		Teachers (*n*=4)	
	Range	*M* (*SD*)	Range	*M* (*SD*)	Range	*M* (*SD*)
Overall, how would you rate the MBCT-C Program? [a]	4-5	4.71 (0.46)	1-5	3.69 (1.11)	3-4	3.25 (0.50)
This program has been helpful	2-5	4.48 (0.79)	1-5	3.77 (1.01)	3-4	3.25 (0.50)
I would recommend this program to others	1-5	4.09 (1.00)	1-5	3.92 (1.04)	3-4	3.50 (0.58)
Less worried/anxious	3-5	4.26 (0.92)	1-5	3.46 (1.05)	3-4	3.25 (0.50)
Better able to manage anger	1-5	3.91 (1.08)	1-5	2.83 (1.12)	3-3	3.00 (0.00)
More positive interactions with others	3-5	4.35 (0.83)	1-5	3.23 (1.30)	3-4	3.50 (0.58)
More patient	2-5	4.00 (0.87)	2-4	3.38 (0.65)	3-4	3.25 (0.50)
The program has helped… in school	1-5	4.00 (1.04)	1-5	3.23 (1.24)	3-4	3.25 (0.50)
The program has helped... at home	3-5	4.14 (0.71)	1-5	3.50 (1.12)	3-4	3.25 (0.50)
I will continue to practice mindful awareness in my life after the program is over	3-5	4.09 (0.79)	-	-	-	-

[a] Likert Scale where 1=very unhelpful, 5=very helpful. All other questions used a Likert Scale where 1= strongly disagree, 5 = strongly agree

Table S.3

How Helpful Was Each Activity? (Children's Evaluation)

Activity	*n*	Range	*M* (*SD*)
Taking Three Mindful Breaths	23	1-5	4.13 (1.06)
Mindfully Moooooving Slooowly	23	1-5	3.65 (1.43)
Raisin Mindfulness	22	1-5	3.86 (1.28)
Mindfulness of the Body	23	1-5	4.00 (1.13)
Opening to One Orange	20	2-5	3.95 (1.00)
Three-Minute Breathing Space	23	1-5	3.96 (1.40)
Mindful Yoga Movements	22	1-5	3.86 (1.39)
Do You Hear What I Hear?	22	1-5	3.95 (1.13)
Visualising with Clarity	21	3-5	4.19 (0.75)
Seeing Through Illusions	22	2-5	4.32 (0.84)
Being in Touch	20	2-5	4.15 (0.93)
Judging Stinks!	19	3-5	4.63 (0.60)

Note: Likert Scale items (1=not at all helpful, 5=very helpful)

CHAPTER 3. PAPER TWO

Mindfulness-Based Cognitive Therapy for Children (MBCT-C) for prevention of internalizing difficulties: A randomized controlled trial with Australian primary school children

3.1 Preamble

The second study is a RCT of MBCT-C as a preventive intervention for children displaying symptoms of internalizing difficulties. Results of the pilot study (Chapter 2) found that MBCT-C was feasible to implement, and the program content was acceptable, for Australian primary school children experiencing symptoms of internalizing difficulties. Although the pilot study results did not discredit the application of MBCT-C for children with externalizing difficulties, it was likely that in order to be successful in this population, more exploratory work would be required to fine-tune the program's implementation. Therefore, the research progressed with a target of internalizing difficulties only.

Measures used in the RCT were mostly consistent with the pilot study. The exceptions were three measures of mental health strengths, which produced negligible to very small effect sizes within the pilot study, and were either the subject of several questions from some of the younger children, or tended to receive responses on the extreme ends of the scales. Additionally, it was intended that the overall length of the assessment battery could be shortened, to reduce participant burden. A literature review was again conducted, and new measures for resilience and quality of life were selected. Although reviews have found that MBIs have greater effects for symptoms of psychopathology than positive measures (Waters et al., 2015; Zoogman et al., 2015), it was hoped that the new measures might show greater response to the interventions within the RCT.

3.2 Statement of Authorship

Title of Paper	Mindfulness-Based Cognitive Therapy for Children (MBCT-C) for prevention of internalizing difficulties: A randomized controlled trial with Australian primary school children
Publication Status	Submitted for publication
Publication Details	Mindfulness

Principal Author

Name of Principal Author (Candidate)	Kathleen Wright
Contribution to the Paper	Reviewed the literature and formed the research idea. Planned and implemented the research, including gaining ethical approvals, liaising with schools, recruiting MBCT-C and CBT facilitators, obtaining informed consent from participants, data collection, and statistical analysis. Responsible for writing and editing the manuscript in collaboration with research supervisors. Submitted the manuscript to the journal, and corresponding author.
Overall percentage	90%
Certification	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.
Signature	
Date	

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);
ii. permission is granted for the candidate in include the publication in the thesis; and
iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Authors	Associate Professor Rachel Roberts Dr Michael Proeve	
Contribution to the Paper	Supervisors of the PhD research program. Oversaw the research idea conceptualisation and planning. Provided training and clinical supervision to the program facilitators. Collaborated in developing the content and structure of the publication manuscript, and reviewing drafts. Provided advice and guidance for responding to journal reviewer feedback.	
Signatures	Rachel Roberts	Michael Proeve
Date		

3.3 Submitted Manuscript

Title Page

Manuscript Title: Mindfulness-Based Cognitive Therapy for Children (MBCT-C) for prevention of internalizing difficulties: A randomized controlled trial with Australian primary school children

Running Head: CHAPTER 3. RANDOMIZED CONTROLLED TRIAL OF MBCT-C

Authors: Kathleen Wright [a], Rachel Roberts [a], Michael Proeve [a]

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Trial Registration: Registration of this trial was not prospectively applied for, as ethics approval was provided prior to 2014 when trial registration became a mandatory condition of ethics approval for all Australian trials (Askie L. M et al., 2017). However, retrospective registration has been applied for through the ANZCTR in June 2017.

Role of the funding source: This research was conducted as part of a PhD in Psychology within the University of Adelaide. No other funding was received.

Compliance with Ethical Standards: Approvals were provided by the University of Adelaide's Human Research Ethics Committee, the South Australian Department of Education and Child Development, and the Catholic Education Office. All adult participants provided informed written consent. Parents/Guardians provided consent for their child, and children provided assent.

Conflicts of interest: The authors declare that there are no conflicts of interest.

Competing interests: The authors declare that there are no competing interests.

CONSORT checklist: attached (Chapter 3 Appendix, page 116)

Abstract

The use of mindfulness-based interventions (MBIs) with children is rapidly growing, but requires well-designed randomized controlled trials (RCTs) of existing programs. Mindfulness-Based Cognitive Therapy for Children (MBCT-C) has preliminary evidence for targeting internalizing symptoms in children. Within MBCT-C (and MBIs more broadly), attention is thought to be a key component of change, but mediation has been relatively unexplored. The overall aim of this RCT was to compare MBCT-C to cognitive behavior therapy (CBT), as a preventive program for children experiencing internalizing difficulties. A mixed factorial design was used, with 2 (program group) by 2 (pre- and post-intervention) conditions. Children from 3 primary schools were randomized to MBCT-C (*n=45*) or CBT (*n*=44) using random permuted blocks, with stratification by school, gender and age. Main analyses were multi-level mixed models. Contrary to the hypotheses, only limited differences were found between programs. Both programs had small effects on symptoms of anxiety and depression, quality of life, attention control, and parent- and teacher-SDQ Total Difficulties, as well as moderate-large effects on shifting attention. There were no statistically significant changes in mindfulness, or sustained attention. The results challenge whether attention (as measured in this study) is a unique component of change for MBCT-C. In summary, this RCT provides a robust test of MBCT-C in a "real life" setting, demonstrating that it may be used as a clinically-oriented preventive program in schools to reduce internalizing symptoms.

Key Words: Mindfulness; MBCT-C; Children; Attention; Anxiety

Mindfulness-Based Cognitive Therapy for Children (MBCT-C) for prevention of internalizing difficulties: A randomized controlled trial with Australian primary school children

Anxiety and depression are two of the most common mental health difficulties of childhood (defined here as persons younger than 18 years), both in Australia, and around the world (D. Lawrence et al., 2015). Despite recent improvements, there are still significant gaps in access to treatment, with large proportions of children meeting diagnostic criteria for anxiety or depressive disorders not accessing mental health services (D. Lawrence et al., 2015). It is also known that a substantial "sub-threshold" population exists, i.e. children who experience elevated symptoms of anxiety and depression beyond age and gender norms, not yet meeting diagnostic criteria, who are not yet being reached with assistance (D. Lawrence et al., 2015). Both children meeting diagnostic criteria for anxiety or depression, and children with "sub-threshold" elevated symptoms, have increased risk of difficulties such as school absence, self-harm, substance use, and future mental disorders (McDermott, 2010). Finding ways to reach and help these children with prevention and early intervention programs is identified as a priority for public health (The Department of Health, 2014).

The use of mindfulness-based interventions (MBIs) for prevention and treatment of mental health difficulties in children is rapidly growing, with the majority of studies conducted on general populations in schools (Zoogman et al., 2015). Recent systematic and meta-analytic reviews concluded that MBIs show promise for a range of behavioral and psychosocial outcomes in children, but their popularity and wide-spread use is not yet matched by the evidence base (Felver et al., 2016; Zenner et al., 2014; Zoogman et al., 2015). Benefits from MBIs included anxiety, depression, attention, behavioral difficulties, sleep, and cardiovascular benefits. Effect sizes ranged from zero to large, and were greater for symptoms of psychopathology compared to other variable types (Zoogman et al., 2015). One meta-analysis compared MBIs to active controls, and found the effect sizes to be small, although the number of included studies (n=8) was low

(Zenner et al., 2014; Zoogman et al., 2015). The reviews converged in identifying major limitations of many studies, such as lack of randomization, failure to report key methodological components (including treatment fidelity), and small sample sizes. They argue against creation of new programs, as there is already great diversity in the field, and recommend well-controlled RCTs of existing programs.

Mindfulness-Based Cognitive Therapy for Children (MBCT-C; Semple & Lee, 2011) is a small-group program that was developed to reduce anxiety in children aged 9-12 years. It is a version of adult Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2002), adapted for children (Semple & Lee, 2011). The overarching objective of MBCT-C is to help children find new ways of relating to their internal experiences (thoughts, feelings/emotions, and body sensations), and to be able to respond to internal and external events with awareness and confidence. Attention is one of the key components of change within MBCT-C theory. Through regular mindfulness training, it is hypothesized that a child may learn to engage their attention in the present moment, and in doing so, spend less time in worry or cognitive rumination (which are usually accompanied by negative emotion; Semple & Lee, 2011).

Currently, cognitive behavior therapy (CBT) has the largest evidence base for prevention and treatment of childhood anxiety and depression. However, effect sizes are known to be limited: When compared to inactive control conditions in meta-analyses, CBT had a small reduction in anxiety and depressive symptoms in at-risk populations of children (P. J. Lawrence et al., 2017; Rasing et al., 2017; Werner-Seidler et al., 2017); when compared to active controls, the pre- to post-intervention effect for depression was small, and anxiety very small (Werner-Seidler et al., 2017). This suggests that although CBT may be effective for some children, there is room for improvement. Within the literature, concerns have been raised that (even with adaptions for children) components of CBT may be beyond some children's cognitive and emotional development (Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012). This is evidenced by findings that CBT may be more effective during the teenage years, when greater development has

occurred. Younger and early adolescent children may grasp a skill in-session, but not be able to generalize that learning to other situations in day-to-day life. Also, CBT is a multi-component process, and although children may grasp individual components, they may struggle to combine them in a multi-component skill. Furthermore, activities in CBT may require causal or hypothetical reasoning, abstract thinking, and/or self-reflection, all of which develop at different rates in different children (Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012).

It is for the above reasons that MBIs have been proposed as an alternative by some researchers. Within MBIs (including MBCT-C), children are invited to bring awareness to their present-moment experience, even if only for brief moments within each practice. There is no attempt to change the *content* of thoughts. Instead, the intention is to allow a child to experience their thoughts and emotions, even if difficult and unpleasant, with non-judgmental and kindly awareness. In doing so, this may change the *context* of their relationship with their internal experiences, and reduce avoidance or other behavioral strategies that maintained the difficulty (Burke, 2010; Felver et al., 2013). Under this theoretical approach, within mindfulness practices it is thought that the cognitive skills required for mindfulness are less complex than those needed for CBT, as the only requirement is to notice what is present in the moment, (i.e. there is no need for logic or hypothetical reasoning associated with changing thought content). Proponents of this theory posit that this may lead to greater effect sizes for MBIs for psychological measures in younger children (Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012).

During the development of MBCT-C, a waitlist RCT of children at-risk for developing anxiety (n=25, aged 9-13 years) found that MBCT-C participants had a reduction in parent-reported attention problems (small-moderate effect) and behavior problems (small effect), compared to the waitlist control group (Semple et al., 2010). There was no difference in reduction of anxiety symptoms between groups; however, it is noted that use of a clinical measure may have created floor effects (as the sample was

sub-clinical). Post-hoc analysis supports this: when all participants' data were pooled to simulate an open trial, the number of children with clinically elevated anxiety scores fell from six to three, from pre- to post-participation. Since then, feasibility was established for American (USA) youth with an anxiety disorder at risk of developing bipolar disorder (*n*=10 aged 9-17; Cotton et al., 2015), and for Australian primary school children experiencing internalizing difficulties (*n*=26; Wright, Roberts, & Proeve, article under review). Taken together, these results provide initial evidence that MBCT-C may be applied with a broader range of cultures, ages, mental health difficulties, and settings. The use of small samples in previous studies also suggests the need for a larger trial of MBCT-C.

Within the first waitlist RCT of MBCT-C, parent-rated attention problems did not mediate the change in parent-rated behavior problems from pre- to post-intervention (Semple et al., 2010). However, the question of whether attention is a mediator of change is still open to investigation. A recent meta-analysis of mindfulness with youth found a small effect for attention and mindfulness measures (combined) compared to control groups, with the authors speculating that attention may be the psychological mechanism of change in MBI, and suggesting the need for further component studies (Zoogman et al., 2015). In exploring attention as a potential mediator, it should be noted that attention is a broad construct, and the exact components and models of attention in children are subject to ongoing consideration in the literature. It is generally acknowledged that attention develops throughout childhood and adolescence, there are biological bases for certain aspects of attention, it is multifaceted, and integrated with other cognitive processes (Chiesa, Calati, & Serretti, 2011). Within mindfulness theory, attention is considered to be one of three elements of mindfulness, the others being attitude and intention (Burke, 2010). Attention in this context includes focused, broad, and sustained attention, skills in switching from one stimulus to another, and "intentional attention" or self-regulation of attention (Burke, 2010). Within the current study, three of these components could be considered: objective tests of sustained and switching attention are

available (Gualtieri & Johnson, 2006b); and self-regulation of attention could be captured by a construct known as attention control, which is the perception of one's own ability to focus and shift attention at will (Muris, Mayer, et al., 2008). If these three aspects of attention are part of mindfulness in children, it could be expected that they each would uniquely mediate the relationship between participation in MBCT-C and mindfulness.

Schools are playing an increasing role in providing support for mental health difficulties, through activities from individual counselling to group-based therapy (D. Lawrence et al., 2015). Teachers are playing an active role in this, with many parents who had sought help for their child's social or behavioral difficulties identifying that their teacher had suggested that they may need additional assistance (D. Lawrence et al., 2015). Support provided by schools can be considered within the three tiered model of service delivery (Felver et al., 2013). Tier 1 is universal programs, delivered to whole-class/school level regardless of presence of difficulties within individual children. Tier 2 is targeted interventions, where children are clustered in small groups on the basis of shared difficulty, psychosocial, or educational needs. Tier 3 is individual intensive interventions, for children with a high level of need. Although the trend for MBI research in schools is towards universal wellbeing programs (Felver et al., 2016), not all schools may choose, or have resources to implement universal programs. Providing schools with a range of evidence-based options can offer them flexibility to implement programs according to the needs of students. As such, small-group mindfulness-based clinical interventions can provide an alternative option at Tier 2, and MBCT-C is one of these. For example, children showing signs of internalizing difficulties (such as high levels of worry, anxiousness, low mood, or being withdrawn), could be selected by teachers and/or parents, and participate in MBCT-C within the school environment.

In summary, MBCT-C has emerged as a program with potential to reduce symptoms of anxiety and depression in children, through small pilot and feasibility studies and a waitlist controlled trial. As a next step in determining its effectiveness, the

overall aim of the current study was to compare MBCT-C to an active control condition (a CBT program) in a RCT, as a Tier 2 preventive intervention for children with internalizing difficulties. The first hypothesis was that MBCT-C would have a greater effect on symptoms of mental health difficulties (anxiety and depression) than CBT. The second hypothesis was that MBCT-C would have a greater improvement in measures of mental health strengths (resilience and satisfaction with life), compared to CBT. Given that MBCT-C is a mindfulness program and attention is thought to be a central mechanism, the third and fourth hypotheses were that MBCT-C participants would show greater improvements in mindfulness and attention compared to CBT. A final aim was to provide a provisional exploration attention as a possible mediator, and it was expected that participation in MBCT-C would create greater change in mindfulness scores through improved attention.

Method

Research Design

This study used a two (MBCT-C, CBT) x two (pre-intervention, post-intervention) mixed factorial design. Children were allocated to program (1:1 ratio) using random permuted blocks with stratification by school, gender, and age. Within each program in each school there was an older and younger group (i.e. four groups per school).

Participants

Participants were children (*n*=89) from three primary schools in South Australia, their parents/guardians and teachers. The children's age range was 8-13 years (*M*=10.6, *SD*=1.1), most were in Years 4-6 (*M*=5.0, *SD*=1.0), with an even gender balance (50.5% female).

Settings and locations. Two schools were government-run and one was private. They were located in: an inner metropolitan region; a satellite town classified as metropolitan; and a provincial satellite town. Schools were co-educational, of similar size (between 375 and 411 enrolled students), with classes from Reception to Year 7. Each

school's demographics may be compared using the index of community socio-educational advantage (ICSEA; Australian Curriculum Assessment and Reporting Authority, 2015), calculated from parent's education level, income, geographical location, and Indigenous background. The number of families in each school within the lower two ICSEA quartiles of the total Australian population were: 58%, 54%, and 29% (i.e. two schools had relative socio-educational disadvantage, and the third school had relative advantage, compared to the national index).

Sampling procedures. Schools were recruited by word of mouth. Once three schools agreed to participate, recruitment ceased. All teachers involved attended an information meeting, after which they were asked to nominate children in their class based on the inclusion/exclusion criteria, including a brief written description of the child's area(s) of difficulty. Each school community was notified about the research through a newsletter or letter to all parents, and parents could nominate their child. Nominations were de-identified by schools then reviewed by the research team to ensure accordance with the inclusion criteria. Following this, an invitation to participate was distributed (by schools) to all parents/guardians of nominated children, along with a consent form, and parent and child Strengths and Difficulties Questionnaires (SDQ; Goodman, 1999). Where consent was provided, the SDQ was used to screen for clinically significant levels of symptoms of both difficulty and distress at a high level of severity that may require full diagnostic assessment as the child may require individual therapy (Semple & Lee, 2011); none met this threshold. No other screening was applied, as the intention was to reach children currently experiencing internalizing difficulties and therefore at risk of future mental illness.

Eligibility criteria. Schools were required to have at least two classes for each year level from Years 4-7 to meet the required sample size per school. Informed consent was provided by adult participants, by each child's parent/guardian, and assent was provided by children. Inclusion criteria for children included being very shy, withdrawn, generally very quiet, appearing to be very anxious, worrying a lot, or seeming down all

the time. Exclusion criteria included being eight years or younger, 13 years or older, or presence of a developmental disorder significantly affecting a child's ability to experience and understand emotions, or to learn and understand new concepts (e.g. Autism Spectrum disorders, Down Syndrome). So long as a child met these criteria, in the opinion of their teacher and parent, they were included.

Exceptions were made for two children with a DSM-IV diagnosis of Asperger's Syndrome. Both children had a high level of functioning. Their teacher's and parent's judgment was that they would be likely to benefit from participation. It was agreed that their progress would be monitored, and if not coping, the child could withdraw. However, both children completed the full research program. Exceptions were also made for four children who turned nine during the program, and one child who was aged 13 years, but in a Year 7 class and was therefore included.

Programs

One session per week was held for both programs, during class time, in weeks 1-10 of Term 2 (April-June) 2014. Groups were facilitated by 10 Masters-level trainee psychologists with provisional registration as a Psychologist with the Australian Health Practitioner Regulation Agency (*n*=5 each for MBCT-C and CBT). They were supervised weekly by two senior academic clinical psychologists (one supervisor per program) and received clinical experience credit towards professional registration as a Psychologist. Group facilitation was in pairs. There was no cross-over between programs for facilitators or supervisors. The two supervisors each attended at least one session for each school, to observe and assess program delivery, and provide verbal feedback. Facilitators were instructed to follow exactly their program manual and training instructions, to the best of their knowledge and ability. However, if deviations occurred they were required to record the details.

For both programs, pre- and post-intervention parent meetings provided information about the research, what children would experience, and how parents could help their child engage with the program and home practice. Weekly emails (written by

the principal researcher) were sent to parents/guardians and teachers, summarizing the week's session, details of home practices, and encouraging engagement with their child. Handouts with this information were also given to children to take home to parents, and were also available during the research period on websites developed for this project.

MBCT-C. In consultation with one author of MBCT-C (R. J. Semple, personal communication, January 7, 2014), an amended 10-session program was trialled, to better fit with the Australian school term (9-10 weeks). Two mindful hearing sessions (5 and 6), and two mindful seeing sessions (7 and 8) were combined into one session each, because of similarity in objectives and content. A content summary for the amended sessions is provided in Supplement 1, Table S.1 (page 105). Content for all other sessions was consistent with the manual, and sessions were 90 minutes in length (Semple & Lee, 2011). The MBCT-C program is written for therapists, and recommends that (at minimum), facilitators have completed an adult 8-week mindfulness course, and to have an ongoing personal practice (Semple & Lee, 2011). In preparation for this trial, MBCT-C facilitators completed Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2009), practiced mindfulness daily, and received six hours of instruction in MBCT-C from an experienced MBCT practitioner (one of the current authors, MP). None of the facilitators had previous experience leading mindfulness groups.

FRIENDS for Life. The FRIENDS for Life program (FRIENDS; Barrett, Farrell, Ollendick, & Dadds, 2006) is a CBT intervention for children from 8-12 years. It aims to prevent and treat anxiety and depression by teaching skills to manage emotions and build psychological resilience. It has an extensive evidence base, with small effect sizes when used in schools for targeted populations, compared to inactive control conditions (Maggin & Johnson, 2014). Given its appropriateness for use in schools, and known effect sizes, it was selected as a robust control condition. Facilitators and their supervisor received the required six hours of accredited FRIENDS for Life training (through the Pathways to Resilience Trust). Children used FRIENDS activity books, and facilitators used the group leader's manual. FRIENDS session materials allow facilitators

flexibility to select from a range of activities. To standardize delivery across schools, facilitators were asked to deliver a specific set of activities (see Supplement 1, Table S.2, page 106). A FRIENDS Psychologist provided guidance on activity selection (M. Cooper, personal communication, April 8, 2014).

Program content overlap. An intention of both programs is to improve emotional awareness, and build an understanding of the relationship between emotions, thoughts, and behaviours, but this is implemented in different styles in each program. Within FRIENDS the teaching style is didactic, and more similar to classroom learning. Facilitators provide information about a topic/concept, then children complete activities related to that topic (e.g. workbook exercises, games, or role plays). In contrast, little up-front information about a topic is provided in MBCT-C. Instead, children are invited to participate in a mindfulness practice, and to simply notice what arises (in terms of thoughts, emotions, or bodily sensations). Thus, in MBCT-C the learning is through the personal experience of mindfulness practice and the practice inquiry (albeit with help from facilitators in labelling an emotion or bodily sensation where a child may not yet have the required vocabulary).

Two other areas were identified that had potential to overlap. The first was an "attention training" activity during FRIENDS Session 4. This is a series of workbook activities completed over 15 minutes. Children are instructed to focus on either positive/helpful, or scarier things within pictures, or an imagined scenario (moving to a new neighbourhood). In contrast, every session of MBCT-C involves systematic training to focus attention on the present moment. Therefore, the degree of overlap was considered to be small. The second concern was a 5-minute relaxation exercise, completed at the end of every FRIENDS session. The instructions focus on deliberately slowing the breath (by counting), tensing and relaxing muscles, then imagining a peaceful and calm place, including trying to imagine what can be heard, smelt, felt on the skin, and tasted, in that peaceful place. Although this relaxation could be considered meditative in nature, it differs significantly from the practices in MBCT-C, which focus

on noticing the present moment experience without trying to change anything, or reach any particular relaxation state, or other goal (i.e. there is no attempt to change the breath, or body, or to visit an imagined peaceful place).

Fidelity of Implementation

The approach to assessment of fidelity was based on findings and recommendations of a systematic review of fidelity of implementation in schools (Feagans Gould et al., 2016). This approach defines fidelity of implementation as a multidimensional construct referring to "the degree to which intervention delivery adheres to the intervention developers' model" (Dane & Schneider, 1998). The authors note that what is implemented in "real life" settings (such as schools) is likely to vary from study to study even when using the same protocol, and therefore it is important to measure and report what was implemented. This review notes that measurement and reporting of fidelity of implementation is at a preliminary stage of research within the literature. While encouraging more rigour in measurement and reporting, they also encourage reporting of any measures related to fidelity so that an informed judgment may be made by reviewers of the research. As such, the current study will measure and report the fidelity assessments conducted. It is noted that third party ratings of facilitators implementation of the protocol was not possible, due to resource constraints, and therefore self-reports of content implementation will be used.

Outcome Measures

Measures were completed during school time under supervision of the lead author. Paper and pencil measures were completed in small groups. The objective attention tests (described below) were administered on two identical laptop computers. Cronbach's α is provided in Supplement 1, Table S.3 (page 107). Measures were selected that have established validity and reliability for children from nine years within healthy populations, unless specified below.

Mental health difficulties. The *Revised Child Anxiety and Depression Scale* (RCADS; Ebesutani et al., 2012) is a 25-item self-report measure of anxiety (RCADS-A;

15 items; primary outcome measure) and depression (RCADS-D; 10 items). Both sub-scales have validity and reliability established in clinical (*n*=303) and non-clinical samples (*n*=1,060). Internal consistency coefficients range from .86 to .91 for the RCADS-A, and .79 to .80 for RCADS-D (Ebesutani et al., 2012).

The *SDQ* (Goodman, 1999) is a 25-item behavioral screening measure. Two sub-scales were used: Total Difficulties (sum of emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems); and Prosocial behavior. The 11-14 self-report version was used, as a previous Australian normative study found it was reliable for children as young as seven years (Mellor, 2004). Concurrent versions for children, parents, and teachers provide multi-informant data. The SDQ has well-established psychometric properties, with coefficient α for the Total Difficulties and Prosocial sub-scales ranging from .62 to .83, and test re-test correlations from .69 to .84 (Mellor, 2004)

Mindfulness and attention. The *Child and Adolescent Mindfulness Measure* (CAMM; Greco et al., 2011) is a 10-item measure. Higher scores indicate greater mindfulness. Although there is debate regarding measurement of mindfulness in children, there is sufficient evidence of reliability and validity for use of single-factor measures, (Pallozzi et al., 2017). The CAMM's single factor reflects awareness of ongoing activity, and judgmental or avoidant responses to thoughts and feelings, a mix of "acting with awareness" and "awareness of judgment", and during confirmatory factor analysis this single factor was found to be a good fit (Greco et al., 2011). Analyses of convergent and incremental validity found negative correlations between the CAMM and children's self-report measures of internalizing and externalizing symptoms, and quality of life. Similarly, the CAMM had positive correlations with teacher-reported academic competence, and a negative correlation with problem behaviours. All of these correlations were present even after controlling for psychological inflexibility and thought suppression, providing evidence of incremental validity in predicting these outcome measures (Greco et al., 2011). Internal consistency was good, with Cronbach's

α = .81 (Greco et al., 2011). The *Attention Control Scale* (ACS) is a 20-item self-report measure of a regulative trait referring to the ability to focus, sustain, and shift attention at will. The ACS has adequate validity and reliability, with Cronbach's α ranging from .70 to .81 (Muris, Mayer, et al., 2008).

The *CNS Vital Signs* (CNSVS; Gualtieri & Johnson, 2006b) *Shifting Attention Test* (SAT) and *Continuous Performance Test* (CPT) are objective tests of switching and sustained attention. They are computerized versions of well-established objective attention measures. Test-retest reliability is similar to non-computerized versions of the same tests, with SAT component reliabilities ranged from .69 to .80 and CPT from .45 to .87 (Gualtieri & Johnson, 2006b). A domain score (SAT-Domain, and CPT-Domain) is calculated by subtracting errors from correct responses. Reaction times for correct responses (SAT-RT and CPT-RT) are also provided. Inbuilt validity indicators are designed to detect problems such as misunderstood instructions, low motivation/effort, or presence of a clinical condition requiring attention. Invalid tests were removed before analysis, as recommended by the test publishers (CNS Vital Signs, personal communication, November 24, 2016).

Mental health strengths. The *Child and Youth Resilience Measure* (CYRM-12) is a 12-item measure, validated in clinical (n=1,494) and non-clinical (n=122) sub-samples, with satisfactory internal consistency (Cronbach's α=.84; Liebenberg, Ungar, & LeBlanc, 2013). The *Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire* (PQOL) is a 15-item measure validated with (n=376) children aged 7-11 years who had experienced depression, and has high internal consistency (Cronbach's α from .87 to .90; Endicott, Nee, Yang, & Wohlberg, 2006). A clinical measure was selected because a literature search did not detect any other brief, psychometrically sound, open-access quality of life measures.

Evaluation and feedback forms. The MBCT-C evaluation form (Semple & Lee, 2011) was adapted to form versions for children, teachers and parent/guardians, with responses on a five-point Likert-type scale (see Supplement 1, Tables S.4-S.5, pages

108-109). A question was added to the children's evaluation form, aiming to measure potential cross-contamination of program content within schools "How often did you talk to classmates about this program?" (1="Never", 5="A Lot").

Fidelity of implementation measures. Attendance was recorded by facilitators. Facilitators were asked to complete one session feedback survey (developed by the lead author) per session. This aimed to assess fidelity by asking whether program content was delivered as intended, perceptions of facilitators own level of preparedness, children's reaction to the content, and level of home practice (see Supplement 1, Table S.6, page 110).

Sample Size and Power

To determine the required sample size, a change on the primary anxiety measure of three points was estimated as clinically meaningful. Calculations were completed by a senior university statistician using Stata (Version 12). Based on a standard deviation of the change in anxiety scores from baseline to follow-up of 4.33 points, the study would have 80% power to detect a difference of three points or greater in anxiety change scores between FRIENDS and MBCT-C if n=41 children per program were recruited (a small to moderate effect). This was based on a pilot study of MBCT-C in Australian primary schools (Wright, Roberts, & Proeve, article under review). Calculations assumed a Type-I error rate of .05, loss to follow-up 5%, and allowed for an inflation factor (or design effect) of 14% due to the clustering of children within intervention groups. The power analysis also allowed for collection of four time points (pre- post-intervention, 3-month and 6-month follow-up), as a follow-up study was also planned.

Randomization Procedures

Randomization was structured to provide an appropriate balance of age and gender for each program group within each school, as per the program manual's guidelines (Barrett, 2012; Semple & Lee, 2011). Within each school, children were divided into gender clusters, ranked by age (in years and months), and each gender cluster was divided in half. For uneven numbers, the median-ranked child was randomly

allocated to the older or younger gender block. Within each older/younger gender block, a research random number sequence generator was used to select half of the participants. A binary random number generator was then used to allocate each group to program (i.e. either FRIENDS or MBCT-C). All randomization sequences were generated using www.randomizer.org. After randomization, identification details were added and teachers checked each group for known friendship difficulties, but no issues were identified.

Blinding

Randomization to program and all statistical analyses were completed by the lead author on a de-identified basis. Within each school there was no attempt to conceal the program a child attended. As part of providing informed consent, participants were told that the study's aim was to assess the effectiveness of MBCT-C when compared to FRIENDS, and whether improvement in attention is the mediator of change for MBCT-C. The two facilitator's supervisors were aware of the research objectives.

Statistical Methods

Analyses were conducted in SPSS version 21. A Type I error rate of .05 was adopted. The main level of analysis was the intention-to-treat sample, with imputation of missing cases. Participants with missing data were excluded for non-parametric tests. Missing data included the children who did not complete follow-up testing (see Figure 1, page 84), invalid CNSVS test data, and SDQ data from parents and teachers who did not respond at post-intervention.

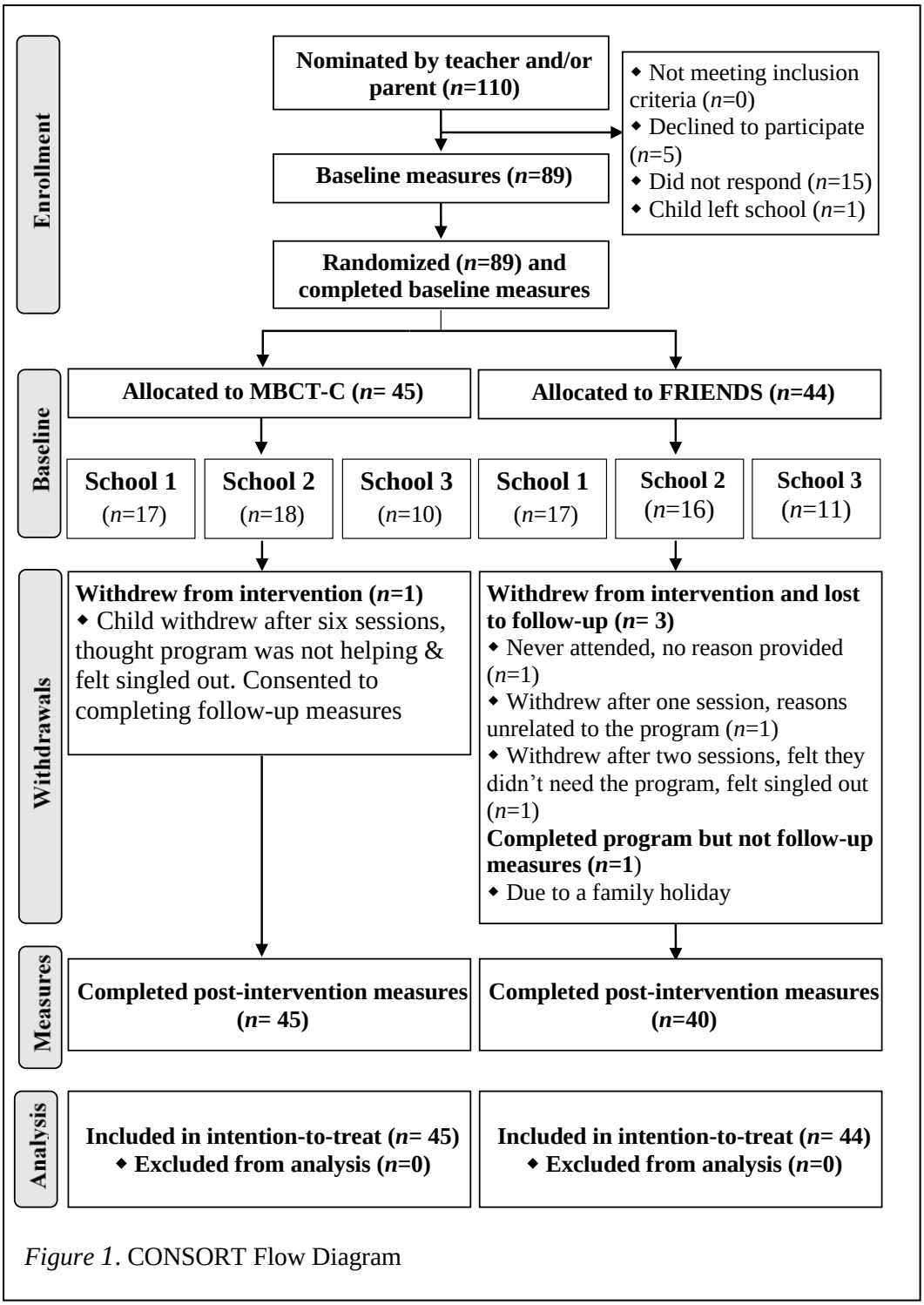

Figure 1. CONSORT Flow Diagram

Multi-level models. To test for differences between programs (controlling for baseline scores), a two time-point multi-level growth model was run for each outcome variable following established procedures (Heck, Thomas, & Tabata, 2014; Singer & Willett, 2003). Models were estimated using SPSS MIXED, allowing for imputation of cases with missing data through maximum likelihood estimation. A stepwise series of

nested models was run. Model A was the unconditional mean model (UMM), used to calculate the intraclass correlation coefficient (ICC). In model B time was added (random intercept and slope). In model C, program, and program*time (random intercept and slope) were added.

The RCADS-A (primary outcome) measure was subject to detailed exploration of covariates including age, gender, school, and number of sessions attended. Models were compared on interpretability and change in fit indices (AIC and BIC). The effect size Pseudo R^2 (calculated from variance components) is the proportional change in unexplained (residual) variance between the UMM and subsequent models (Singer & Willett, 2003). All other measures were analyzed from models A through C only. Simple effects (Cohen's *d*) were calculated for the change in model estimated mean scores over time, for the combined sample, and for each program. Models have two levels: repeated measures of time at level 1 (within-subjects change), and individual child at level 2 (between subjects). Three-level models were initially run (with school at level 3), but were not progressed due to non-convergence, poor model fit, and/or level 3 residual variance being very small and not statistically significant.

Mediation. Due to resource constraints, it was not possible to create a temporal delay between the measurement of attention (the potential mediator) and mindfulness. Therefore, an exploration of indirect effects (of program on mindfulness via attention) was conducted using the PROCESS macro for SPSS, and Hayes and Rockwood's (2017) guidance for mediation analysis in pre- to post-intervention designs. This guidance recommends that mediation analyses may be conducted even with cross-sectional or correlational designs, to explore potential causal relationships, providing the limitations of such analyses are clearly outlined. In the current study, it was not possible to demonstrate causality, but given the lack of knowledge within the literature regarding mediators in mindfulness, exploration of a possible causal relationship was of interest.

Within PROCESS (A. F. Hayes & Rockwood, 2017), bootstrapping provides confidence intervals for the indirect effect, and variables not meeting normal distribution

are permitted. Separate models were run for each attention variable due to complexity and difficulty with interpretation when all were entered together. A generic mediation path diagram is displayed in Figure 2 (below) illustrating the parameters provided by PROCESS. Model I shows direct effects before the mediator is entered. Model II is for mediation. The parameter of interest is (*a*b* = *ab*), the indirect effect of program on CAMM T_2 through the attention variable when controlling for baseline attention and mindfulness. The partially standardized indirect effect ($ab_{ps} = ab/SD_{\text{CAMM T2}}$) may be interpreted as the number of standard deviations by which the outcome variable (CAMM T_2) will change, for every one unit increase in the independent variable (program) indirectly via the mediator (Attention T_2), controlling for baseline mindfulness and attention (A. F. Hayes & Rockwood, 2017).

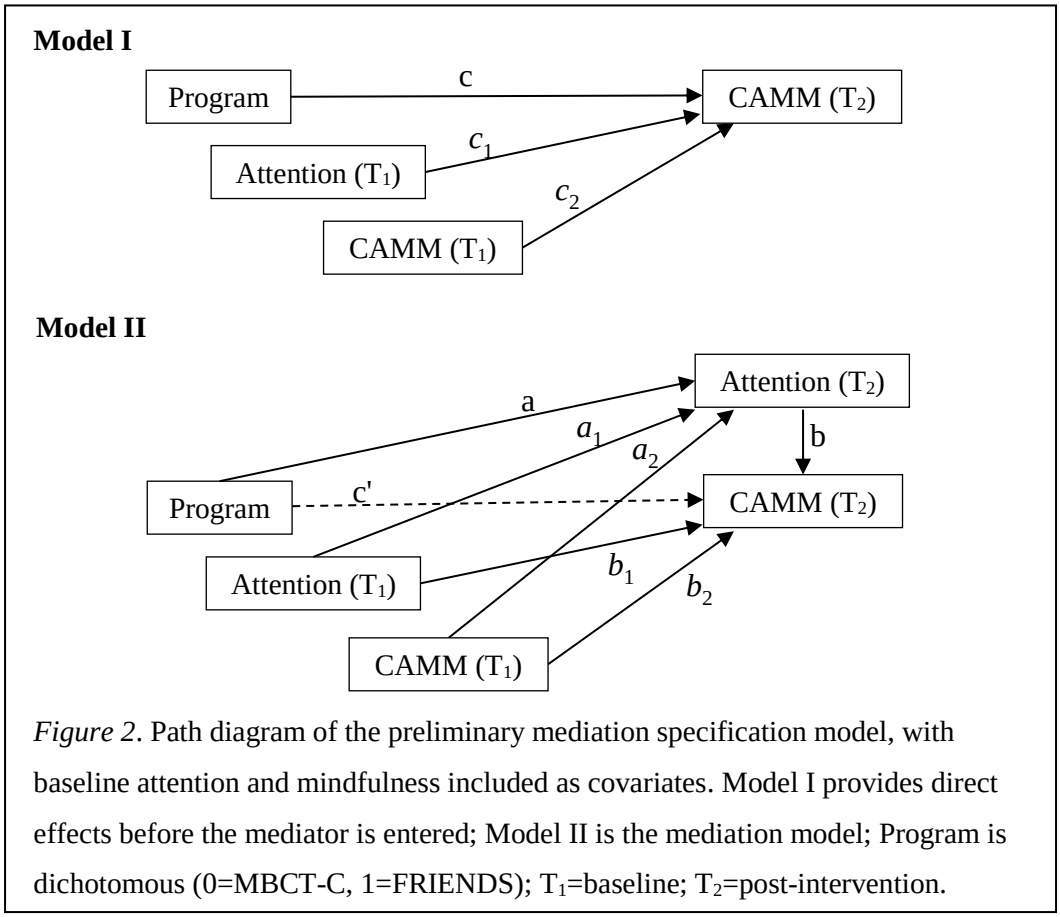

Figure 2. Path diagram of the preliminary mediation specification model, with baseline attention and mindfulness included as covariates. Model I provides direct effects before the mediator is entered; Model II is the mediation model; Program is dichotomous (0=MBCT-C, 1=FRIENDS); T_1=baseline; T_2=post-intervention.

Results

Participant Flow

Participant flow is outlined in Figure 1 (page 84). Parents/guardians of all nominated children were sent an invitation to participate. The consent rate was 81% (reasons for not providing consent, where known, are detailed in Figure 1). Group numbers within schools were balanced during randomization; however, in School 2 an error within the school meant that two children attended a group different to the one they had been allocated to. As they had already completed one session before this was discovered, a decision was made to keep them in that same group. For one child this was a change from FRIENDS to MBCT-C, and for the second child it was a change from the older to younger MBCT-C group. Reasons for withdrawal and/or loss to follow-up are noted in Figure 1 (page 84). Cumulative attendance by program can be seen in Supplement 1, Table S.7 (page 111), and there was no difference in attendance between programs (Kolmogorov-Smirnov Z=1.13, p=.16). Attendance at parent meetings was low, with 5-10 attending at pre-intervention (per school), and fewer than five at post-intervention. There were no adverse events during either program.

Recruitment

Recruitment occurred during Term 1 of 2014 (February-April). Baseline data was collected in the last two weeks of Term 1, (i.e. two to four weeks prior to programs commencing). Post-intervention testing occurred during Weeks 1-2 of Term 3 (i.e. two to four weeks following program completion).

Baseline Demographics and Clinical Characteristics

At baseline, children in MBCT-C (n=45) and FRIENDS (n=44) had a similar match of gender and age. For MBCT-C, children were aged 8-12 years (M=10.6, SD=1.1), with 53.3% being female. For FRIENDS, children were aged 8-13 years (M=10.6, SD=1.1), with 47.7% being female. A one-way MANOVA found no statistically significant differences between programs for baseline measures, F(16, 50)=0.56, p=.90, partial η^2=.15.

Preliminary Analysis

Descriptive statistics are provided in Table 1 (page 90). Data distributions were checked. Outliers were each consistent within the overall pattern of results for the individual child, therefore none were removed. Correlations were inspected as a validity check (see Supplement 1, Table S.8, page 112).

RCADS Anxiety

Results are displayed in Table 2 (page 92). The ICC showed that 42.2% of model variance was within children, and 57.8% between children. Model B converged, with time as a significant predictor, and an improvement in Pseudo R^2 of 52% at level 1, and 10% at level 2. Model C also converged, but neither program, nor program*time were statistically significant, with no improvement on model fit compared to Model B. In subsequent model exploration it was found that there was no difference in slope for any of the covariates. The most parsimonious model is displayed as Model D, a random intercept and slope model, with intercepts for age (centered, with age 8 years=0) and school being statistically significant. The overall interpretation is that there was no difference between programs in either intercept or slope, and that although children of different ages and schools may have had different intercepts, there was no difference in rate of change (model slope) for either measure.

Table 1

Observed Means (and Standard Deviation) by Program and Time Point

Measure	MBCT-C				FRIENDS			
	Pre (n=45)[a]		Post (n=45)[b]		Pre (n=44)[c]		Post (n=40)[d]	
RCADS								
Anxiety	15.36	(6.40)	12.08	(7.92)	15.23	(8.03)	13.45	(7.50)
Depression	10.81	(5.05)	8.44	(5.98)	9.64	(4.01)	8.78	(5.02)
CAMM	24.22	(5.70)	26.20	(7.00)	25.01	(6.96)	24.90	(6.84)
ACS	28.85	(9.92)	31.69	(12.46)	29.09	(8.65)	31.40	(8.55)
CYRM-12	43.51	(9.24)	44.64	(11.70)	42.93	(7.46)	45.69	(8.41)
PQOL	53.81	(11.63)	57.73	(11.51)	58.16	(8.53)	58.94	(9.29)
SAT								
Domain	22.34	(9.97)	28.29	(13.18)	17.87	(11.11)	28.97	(12.01)
RT	1.21	(0.21)	1.11	(0.18)	1.21	(0.15)	1.16	(0.19)
CPT								
Domain	32.00	(7.60)	32.64	(7.14)	30.07	(7.26)	30.85	(7.47)
RT	0.50	(0.07)	0.48	(0.06)	0.51	(0.06)	0.50	(0.05)
SDQ Total Difficulties								
Child	13.01	(5.45)	12.31	(6.16)	13.15	(5.97)	12.93	(5.90)
Teacher	12.12	(7.07)	9.81	(5.94)	12.48	(5.59)	8.89	(4.52)
Parent	14.28	(7.71)	10.92	(5.73)	12.87	(6.50)	11.88	(6.30)
SDQ Prosocial								
Child	8.04	(1.86)	7.85	(1.52)	8.10	(1.68)	7.75	(1.86)
Teacher	6.31	(2.48)	6.78	(2.25)	6.17	(2.48)	6.94	(1.99)
Parent	7.78	(1.92)	7.87	(1.95)	8.15	(1.78)	8.48	(1.69)

Note: RCADS=Revised Child Anxiety and Depression Scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses (seconds); CPT=Continuous Performance Test; SDQ=Strengths and Difficulties Questionnaire.

[a]Except SAT (n=35) and CPT (n=43) subscales.

[b]Except SAT (*n*=38) and CPT *(n*=39) subscales, Teacher SDQ (*n*=43), and Parent SDQ (*n*=29).

[c]Except SAT (*n*=38) and CPT (*n*=41) subscales.

[d]Except SAT and CPT subscales (*n*=39), Teacher SDQ subscales (*n*=41), and Parent SDQ subscales (*n*=24).

Table 2

MLM Estimated Coefficients (and Standard Error) for RCADS Anxiety

	Model			
Parameter	A	B	C	D
Fixed Effects				
Initial Status				
Intercept	14.08 (0.71)***	15.29 (0.68) ***	15.36 (0.95) ***	16.07 (1.70) ***
Program			-0.16 (1.36)	
Age (centered)				-1.93 (0.58)**
[School=0]				4.55 (1.60) **
[School=1]				3.87 (1.60) **
[School=2]				0[a]
Rate of change				
Time		-2.45 (0.79) *	-3.28 (1.07) **	-2.52 (0.77) **
Program*Time			1.77 (1.57)	
Variance Components				
Level 1	23.99 (3.72)***	11.47 (4.86) *	11.10 (4.81) *	13.92 (4.78) **
Level 2	32.88 (7.12) ***	29.55 (6.40) ***	29.66 (6.40) ***	22.71 (5.53) **
Pseudo R^2 change[b]				
Total		0.28	0.28	0.36
Level 1		0.52	0.54	0.42
Level 2		0.10	0.10	0.31
-2LL[c]	1155.8	1149.4*	1148.1	1132.2*
AIC	1161.8	1157.4	1160.1	1146.2

Note. All models are random intercept and slope; Model A is the UMM; Model B is the unconditional growth model; Model C includes program and program*time; Model D is the final model; Age is centered so that 8 years=0.

[a]This parameter is set to zero because it is redundant.

[b]Pseudo R^2 change is compared to Model A.

[c]Statistical significance for -2LL is for change compared to Model A.

*p<.05, **p<.01 ***p<.001

Other Outcome Measures

Results are displayed in Table 3 (page 94). The overall pattern was an effect of time, with improvements in RCADS-D, ACS, PQOL, SAT-Domain, and SDQ Total Difficulties for both parents and teachers. The effect of time approached statistical significance for the CAMM. There was only one statistically significant difference between programs, the SAT-Domain, a very large effect for FRIENDS and moderate for MBCT-C. There were no statistically significant changes in resilience, CPT sub-scales, SDQ Total Difficulties for children, or any SDQ Prosocial subscales. The SAT-RT variable did not meet the distribution assumptions required for MLM and this was not resolved through data transformation. Therefore, a non-parametric test analyzed change between baseline and post-intervention, with program as the grouping variable. The reduction in reaction time was greater for MBCT-C (*Md*=-101.0, *n*=34) than FRIENDS (*Md*=-19.0, *n*=34), a medium effect (*U*=404.0, z=-2.13, *p*=.03, *r*=.26).

Table 3

2-Level Mixed Model Analyses

Measure	Program	Time	Program*time	*d*		
				MBCT-C	FRIENDS	Total
RCADS						
Anxiety	$F(166.7,1) = 0.01$, $p=.91$	**$F(118.7,1) = 9.32$, $p=.003$**	$F(121.0,1) = 1.27$, $p=.26$	-0.44	-0.21	-0.33
Depression	$F(166.2,1) = 1.52$, $p=.22$	**$F(121.3,1) = 10.85$, $p=.001$**	$F(123.4,1) = 1.92$, $p=.17$	-0.48	-0.19	-0.34
CAMM	$F(173.2,1) = 0.40$, $p=.53$	**$F(108.8,1) = 3.14$, $p=.08$**	$F(112.2,1) = 1.79$, $p=.18$	-0.30	0.02	-0.15
ACS	$F(167.4,1) = 0.30$, $p=.87$	**$F(121.2,1) = 3.91$, $p=.05$**	$F(123.4,1) = 0.05$, $p=.82$	0.29	0.24	0.27
CYRM-12	$F(165.4,1) = 0.17$, $p=.68$	$F(124.1,1) = 0.74$, $p=.39$	$F(126.0,1) = 0.60$, $p=.44$	0.12	0.29	0.20
PQOL	**$F(160.8,1) = 5.20$, $p=.02$**	**$F(127.9,1) = 7.91$, $p=.006$**	$F(129.4,1) = 2.38$, $p=.13$	0.39	0.08	0.24
SAT-Domain	$F(148.4,1) = 3.34$, $p=.07$	**$F(94.3,1) = 10.75$, $p=.001$**	**$F(96.7,1) = 4.38$, $p=.04$**	0.54	1.04	0.78
CPT-Domain	$F(161.9,1) = 2.17$, $p=.14$	$F(87.6,1) = 0.02$, $p=.90$	$F(87.9,1) = 0.03$, $p=.88$	0.02	0.06	0.04
CPT-RT	$F(153.0,1) = 0.07$, $p=.80$	$F(110.9,1) = 2.42$, $p=.12$	$F(110.8,1) = 0.08$, $p=.78$	-0.25	-0.18	-0.21

Table continues

Table 3 continued

Measure	Program	Time	Program*time	*d*		
				MBCT-C	FRIENDS	Total
SDQ Total Difficulties						
Student	$F(172.0,1) = 0.01$, $p=.91$	$F(110.2,1) = 0.55$, p=.46	$F(113.6,1) = 0.09$, $p=.77$	-0.12	-0.05	-0.09
Teacher	$F(167.6,1) = 0.14$, $p=.71$	**$F(118.5,1) = 8.10$, $p=.005$**	$F(119.1,1) = 0.76$, $p=.39$	-0.44	-0.63	-0.53
Parent	$F(130.5,1) = 1.27$, $p=.26$	**$F(77.3,1) = 3.97$, $p=.05$**	$F(78.4,1) = 0.52$, $p=.47$	-0.38	-0.18	-0.29
SDQ Prosocial						
Student	$F(170.0,1) = 0.02$, $p=.89$	$F(105.8,1) = 0.41$, $p=.52$	$F(109.7,1) = 0.12$, $p=.73$	-0.11	-0.20	-0.15
Teacher	$F(167.8,1) = 0.11$, $p=.74$	$F(119.2,1) = 2.71$, $p=.10$	$F(119.8,1) = 0.04$, $p=.83$	0.25	0.30	0.27
Parent	$F(135.2,1) = 1.21$, $p=.27$	$F(96.3,1) = 0.36$, $p=.55$	$F(97.5,1) = 0.06$, $p=.81$	0.12	0.19	0.15

Note: Bold indicates $p< .05$. RCADS=Revised Child Anxiety and Depression scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses (seconds); CPT=Continuous Performance Test; SDQ=Strengths and Difficulties Questionnaire.

Preliminary Mediation Analysis

Results are displayed in Table 4 (page 97). Program did not predict CAMM (T_2) scores (paths *c*) in Models I. In Models II, examination of the *ab* coefficients found a statistically significant mediation effect for SAT-RT, but not for any other variable. In this model, post-intervention mindfulness would decrease by 0.13 standard deviations for every one unit increase in program (a move from MBCT-C to FRIENDS), indirectly via the mediator (SAT-RT), controlling for baseline CAMM and baseline SAT-RT.

Evaluation Forms

Response rates were 96% for children, parents 63%, and teachers 80%. See Supplement 1 (Tables S.4 and S.5, pages 108-109) for descriptive statistics and comparisons. On average, MBCT-C participants rated the program as "helpful", whereas FRIENDS participants rated the program "very helpful", a small difference. There was no statistically significant differences in ratings of how much children spoke to classmates about the program: 39% of MBCT-C and 30% of FRIENDS participants spoke to classmates "a little", and 5% of MBCT-C and 13% of FRIENDS participants spoke "a lot". Therefore, cross-contamination of program content was not considered a significant risk to the trial.

Table 4

Mediation Parameter Estimates for Standardized Direct (Model I) and Indirect (Model I) Effects

	Attention Control (*n*=84)			SAT-Domain (*n*=67)			SAT-RT (*n*=67)			CPT-Domain (*n*=74)			CPT-RT (*n*=74)		
Model	*β*	*SE*	95% CI	*β*	*SE*	95% CI	*β*	*SE*	95% CI	*β*	*SE*	95% CI	*β*	*SE*	95% CI
I															
c	-1.24	1.30	[-3.83, 1.35]	-0.36	1.53	[-3.41, 2.69]	-0.94	1.14	[-3.83, 1.96]	-1.71	1.58	[-4.87, 1.44]	-1.58	1.55	[-4.66, 1.50]
c_1	**0.14**	**0.07**	**[0.00, 0.29]**	0.08	0.07	[-0.07, 0.23]	6.67	4.07	[-1.46, 14.80]	0.06	0.13	[-0.20, 0.31]	-21.35	13.03	[-47.34, 4.65]
c_2	**0.44**	**0.11**	**[0.23, 0.70]**	**0.59**	**0.12**	**[0.35, 0.83]**	**0.57**	**0.12**	**[0.34, 0.80]**	**0.43**	**0.13**	**[0.17, 0.68]**	**0.41**	**0.13**	**[0.15, 0.66]**
II															
a	-0.42	1.92	[-4.23, 3.39]	3.85	2.58	[-1.30, 9.00]	0.07	0.04	[0.00, 0.14]	-0.33	1.55	[-3.42, 2.77]	0.00	0.01	[-0.02, 0.02]
a_1	**0.71**	**0.11**	**[0.50, 0.92]**	**0.68**	**0.13**	**[0.43, 0.94]**	**0.42**	**0.10**	**[0.21, 0.62]**	**0.51**	**0.13**	**[0.26, 0.76]**	**0.70**	**0.08**	**[0.54, 0.85]**
a_2	-0.09	0.16	[-0.40, 0.22]	0.22	0.20	[-0.18, 0.63]	**0.01**	**0.00**	**[0.00, 0.01]**	0.07	0.13	[-0.18, 0.32]	0.00	0.00	[0.00, 0.00]
b	**0.30**	**0.07**	**[0.16, 0.43]**	0.10	0.07	[-0.05, 0.24]	**-10.93**	**4.82**	**[-20.56, -1.29]**	-0.01	0.12	[-0.25, 0.24]	-3.81	20.32	[-44.36, 36.72]
b_1	-0.07	0.08	[-0.23, 0.09]	0.02	0.09	[-0.16. 0.20]	**11.23**	**4.43**	**[2.39, 20.08]**	0.06	0.14	[-0.23, 0.35]	-18.69	19.30	[-57.18, 19.80]
b_2	**0.47**	**0.10**	**[0.28, 0.66]**	**0.57**	**0.12**	**[0.33, 0.81]**	**0.63**	**0.12**	**[0.40, 0.86]**	**0.43**	**0.13**	**[0.17, 0.69]**	**0.41**	**0.13**	**[0.15, 0.66]**
c'	-1.12	1.18	[-3.46, 1.23]	-0.73	1.54	[-3.81, 2.36]	-0.16	1.44	[-3.05, 2.72]	-1.72	1.59	[-4.89, 1.46]	-1.57	1.56	[-4.68, 1.54]
ab	-0.12	0.56	[-1.36, 0.90]	0.37	0.49	[-0.13, 1.98]	**-0.77**	**0.47**	**[-2.05, -0.05]**	0.00	0.22	[-0.46, 0.53]	-0.01	0.21	[-0.56, 0.34]
ab_{ps}	-0.02	0.10	[-0.23, 0.16]	0.06	0.08	[-0.03, 0.34]	**-0.13**	**0.08**	**[-0.33, -0.01]**	0.00	0.04	[-0.07, 0.08]	0.00	0.03	[-0.09, 0.05]

Note. Bold indicates $p < .05$. SAT-Domain=Shifting Attention Test Domain score; SAT-RT=Shifting Attention Test reaction time; CPT-Domain=Continuous Performance test domain score; CPT-RT=Continuous Performance Test reaction time. The dichotomous independent variable in each model is program (0=MBCT-C, 1=FRIENDS).

Fidelity of Implementation

Descriptive statistics for facilitator session feedback surveys are provided in Supplement 1, Table S.6 (page 110). A greater number of feedback forms were completed for FRIENDS (response rate 69%) than MBCT-C (response rate 52%). At least one facilitator feedback form was completed per session. For both programs, facilitators agreed that the sessions worked well, they felt prepared, and thought that the children were engaged and understood the content. The level of home practice was relatively low for both programs. Within the open-ended comments, facilitators noted that challenges in a school environment included children arriving late to sessions, and interruptions for activities such as sports events and class photographs. Furthermore, for three groups, facilitators reported significant difficulty with managing the behavior of one child. This was not thought to be a reaction to the program material, as parents and teachers indicated that the children were demonstrating similar behavior at school and home. Details of variations to protocol are displayed in Supplement 1, Table S.9 (page 115). These variations are not considered a significant impediment to the trial, as the overall number of missed activities was low, and balanced between programs.

Discussion

The overall aim of this study was to compare MBCT-C to an active control condition in a RCT, as a preventive intervention for children displaying symptoms of internalizing difficulties. In contrast to the hypotheses, almost no difference was found between programs for anxiety or depression, mental health strengths, or attention. However, from pre- to post-intervention, for both programs there were statistically significant, small improvements, in anxiety, depression, quality of life, attention, and parent and teacher SDQ Total Difficulties. Furthermore, although MBCT-C did not outperform CBT as anticipated in this age group, the overall pattern of results suggest that MBCT-C performed comparably to FRIENDS. This can be considered a positive finding given that MBCT-C is an emerging program, whereas FRIENDS has been subject to extensive testing, and has a large body of evidence supporting its application

both for treatment and prevention of childhood anxiety (Fisak, Richard, & Mann, 2011; Maggin & Johnson, 2014).

The small within-group effect on anxiety in this RCT is consistent with small within-group effects for FRIENDS used in schools for targeted populations (Fisak et al., 2011; Maggin & Johnson, 2014), which also indicates that in this RCT the FRIENDS program performed at a level that should be expected. That MBCT-C had a small effect on anxiety in this RCT is in contrast to the previous waitlist RCT, where no difference in anxiety was found between MBCT-C and a waitlist control (Semple et al., 2010). Similarly, the detection of a reduction in depressive symptoms is an improvement on an uncontrolled trial of MBCT-C (*n*=25 children aged 9-12 years) which found no statistically significant effect of participation on depressive symptoms in a non-clinical sample (Lee et al., 2008). Both of these former studies used clinical measures. It is likely that in the current study, the selection of a measure of anxiety and depression that is suitable for use in both clinical and non-clinical populations avoided limitations of floor or ceiling effects. As such, this is a useful contribution to understanding the effectiveness of MBCT-C in a sub-clinical population. Furthermore, in finding that MBCT-C may assist with both symptoms of depression and anxiety, the current study provides support for the application of MBCT-C for 9-12-year-old children experiencing internalizing difficulties more broadly.

The results obtained for the mindfulness and attention measures in this study were unexpected given that both constructs are central components of MBCT-C, and not a core focus of the FRIENDS program. Turning first to mindfulness, it is noted that the effect of time was approaching statistical significance. Given that the power of this study was calculated on the core anxiety measure and not the CAMM, a possible explanation is that the study lacked the power to detect a small change in the CAMM, or differences in CAMM scores between programs if they were present. However, two published pilot studies of MBCT-C which used the CAMM in clinical settings with adolescent patients found only a very small change (Ames et al., 2014) and no change (Cotton et al., 2015).

Furthermore, a RCT of the .b ("dot b") mindfulness in schools program in Year 7-8 students in Australian schools did not detect any change in the CAMM (Johnson, Burke, Brinkman, & Wade, 2016). As discussed earlier, measurement of mindfulness in children is challenging (Pallozzi et al., 2017), and our results support the need for further research to develop measures sensitive to change in children.

The pre- to post-intervention analyses of the attention variables suggest that although participation in MBCT-C did lead to improvements in self-report and shifting attention, there were similar improvements seen for FRIENDS participants. Although attention is discussed as a core component of mindfulness training, there are few controlled trials in children that have assessed change using objective attention measures, or self-report and objective measures side by side. For example, a meta-analysis found a small effect for attention and mindfulness measures combined, but none of the six included studies used an active control condition, and only one used an objective attention measure (Zoogman et al., 2015). The one study that did use objective measures (*n*=228 children in Years 1-3) led to results similar to our findings: no change in sustained attention, and a moderate difference between intervention and waitlist control groups for selective attention (Napoli, Krech, & Holley, 2005). It is also known that higher self-report attention control is correlated with lower psychopathology symptom measures (including anxiety and depressive symptoms), and this may also explain the similarity in results between programs (Muris, Mayer, et al., 2008). Altogether, our results suggest that pre- to post-intervention improvements in attention seen in previous studies may not be unique to mindfulness programs.

The attention results in our study could be interpreted as failure to support the hypothesis of Zoogman et al. (2015), that attention is a unique mechanism of change for mindfulness programs, and/or, failure to support the theory that self-regulation of attention, sustained and switching attention are unique elements of mindfulness (Burke, 2010). However, consideration must be given to several limitations. The mediation analyses conducted were preliminary, and did not provide the temporal delay between

measurement of attention as a mediator, and measurement of mindfulness as the outcome variable. Also, as discussed above, if the limitations of measuring mindfulness in children mean that there may be limitations in using mindfulness as a measure of change, this would also have impeded the mediation analysis. Another consideration is that attention is multifaceted and a broad range of self-report and objective attention measures are available (Chiesa et al., 2011). Therefore, an alternative explanation could be that other measures or facets of attention not measured in this study may have produced different results. Nonetheless, the results of the current study are likely to be of interest for researchers planning future studies that explore mechanisms of change for MBI with children, in that they do not support the role of attention as a mediator of change in MBCT-C. Future research could use appropriately spaced temporal measurement of attention as a mediator variable, different components or measures of attention, and/or potentially utilize an alternative outcome variable (such as anxiety or depression), to further explore mediation effects.

Our study also provided multi-respondent data through the SDQ. The pattern of results was similar for teachers and parents for both programs, with a reduction in total difficulties (small effect for parents, moderate for teachers) and no change in prosocial scores. Taken together, this suggests that teachers and parents were experiencing/seeing similar sorts of change in the children, for both programs. Given this, it is surprising that the children's SDQ Total Difficulties showed no change; however, it possible that the parent and teacher's results reflect the reduction in anxiety and depression reported by children on the RCADS. To explore this in future research, the emotional symptoms facet of the SDQ Total Difficulties scale could be examined. The lack of change in the prosocial behavior scores, alongside the lack of change in resilience, is in contrast with a meta-analysis of mindfulness programs in school settings, which found small effects for resilience measures (including prosocial behavior) across 17 studies of varied methodologies (Zenner et al., 2014). However, our result supports a systematic review of meditation interventions in schools (Waters et al., 2015), and a meta-analytic review of

mindfulness interventions for youth (Zoogman et al., 2015), which both suggested that effects are more consistent for reducing negative rather than promoting positive outcomes.

This RCT, conducted in three schools, tested MBCT-C in a "real life", rather than tightly-controlled clinical setting. Overall, the evaluation forms and facilitator surveys indicated that the program was well received and found to be helpful. However, there are also areas that could be improved in future research. In our study, both programs' facilitators reported that only a few children completed home practice. Engaging parents in this setting was another challenge, as groups were conducted during school time by external facilitators, and it is logical that this would have at least partially contributed to the low levels of home practice. Providing parents and teachers with weekly updates went some way to helping engage parents and teachers, as both groups on the whole reported that they were aware of what children doing in the program each week. Given that a meta-analysis of MBIs in schools found a strong relationship between minutes of mindfulness practice (including home practice) and strength of effect size (Zenner et al., 2014), future studies of MBCT-C in school settings could explore ways to increase home practice, potentially through greater involvement of parents.

Fidelity of program implementation was measured and reported, however limitations included the lack of a third party assessment of implementation of the program protocols, due to resource limitations. Although one facilitator feedback form was received for each session conducted, the response rate could be improved in future studies. Therefore, it is noted that while the current study's measurement and reporting of fidelity of program implementation is an improvement over many prior studies of mindfulness programs in school settings, there is room for improvement in future studies (Feagans Gould et al., 2016).

Given the small effect sizes for both programs, future studies could explore whether different children respond to MBCT-C or CBT, perhaps based on factors such as differential cognitive development, learning styles (given that the styles are so different

between programs), or severity of symptoms. It could also be possible to improve effect sizes through more focused targeting of students experiencing internalizing difficulty, for example through use of screening to better identify sub-clinical cases. However, in the current study, the view was taken not to exclude children who may benefit from participation.

When completing the questionnaires, parents and teachers were not blind to the study's objectives or which program their child had participated in. However, given that both experimental conditions were active therapy programs, the risk of bias (if present) is assumed to be consistent for both programs. Although we asked whether children had an existing diagnosis of a mental health disorder, we did not ask whether any child was undergoing external counselling or receiving other mental health support. It would also have been useful to track external measures of change, such as academic performance, or other measures of positive progress or disciplinary action. Each of these aspects could be considered in future research. Despite these limitations, the study has fulfilled almost all of the recommendations of Felver et al. (2016) for conducting research into mindfulness in schools, and this is a significant strength. For example, the study took an existing mindfulness-based program into a RCT, utilized an established CBT program as an active control, used a combination of multi-informant, self-report and objective measures, reported fidelity, conducted preliminary component analyses on attention as a possible mechanism of change, and controlled statistically for differences between schools.

To the best of our knowledge, this is the first RCT of MBCT-C that has used an established therapy program as a control condition, and in doing so begins to answer a key criticism that few studies of MBIs have used an active control (Zenner et al., 2014; Zoogman et al., 2015). Overall, the findings have demonstrated that MBCT-C can be successfully implemented in this new population and context: Australian primary schools, as a preventive program for internalizing difficulties. The study has provided a valuable contribution by measuring the relative performance of MBCT-C to a CBT

program, across measures of mental health difficulties and strengths, attention, and mindfulness. Results challenge the hypothesis that improvements in attention are unique to mindfulness programs, as equivalent improvements were seen for CBT.

Supplement 1

Table S.1

MBCT-C Program Content for Adapted Sessions 5 and 6

Session and Theme	Key Points	In-Session Practices	Home Practices
5. Music to Our Ears (combined 12-week program sessions 5 and 6)	- Thoughts, feelings, and body sensations often colour how we experience the world - With our thoughts, we create individual and unique relationships and experiences - Awareness holds it all	- Three-Minute Breathing Space - Do you hear what I hear? - Mindfulness of the Body - Three-Minute Breathing Space	- Three-Minute Breathing Space - Mindfulness of the Body - Mindful Listening
6. Strengthening the Muscle of Attention (combined 12-week program sessions 7 and 8)	- Judging is not the same as noting - Judging often changes how we experience the world - Becoming more aware of judgments may change how we relate to thoughts and feelings - Discovering “choice points”	- Three-Minute Breathing Space - Seeing What Is in the Mind’s Eye - Seeing Through Illusions - Moving Mindfully - Seeing What Is Not There - Three-Minute Breathing Space	- Three-Minute Breathing Space - Stressful Events - Seeing Five New Things

Table S.2

FRIENDS Session Activities Implemented

Session No.	Activities Selected
1	Activities 2, 3, 4, and 5.
2	Let's Talk About Feelings (with Option B), Activities 2 and 3.
3	Activity 1, Tom's Body Clues When Happy, Introduce FRIENDS Step 2, Activities 3, 4, and 6
4	Activity 2, Introduce FRIENDS Step 3, Activities 3 and 4, and Unhelpful and Helpful Thoughts.
5	Activity 1, Changing Unhelpful Thoughts (handouts 1-2), and Activity 3.
6	Introduce FRIENDS Step 4, Activity 1, Introduce the Coping Step Plan for Difficult Situations, and Activity 2.
7	Activity 1, The "Hot Seat" Game, and Activity 4
8	5-Block Problem Solving Plan, Activity 1, and Review FRIENDS Step 4
9	Introduce FRIENDS Step 5, Be Happy With Yourself For Trying, Group Discussion, Activity 4, Let's Learn the FRIENDS 6th Step, Let's learn the FRIENDS 7th & last step.
10	Activity 1, Group Discussion, Warm-Down Activity, Present Certificates and (brief) party!!

Table S.3

Cronbach's α Coefficients by Time Point

Measure	Pre (*n*=89)	Post (*n*=85)
RCADS		
Anxiety	0.83	0.86
Depression	0.77	0.87
CAMM	0.71	0.75
ACS	0.83	0.89
CYRM-12	0.81	0.89
PQOL	0.91	0.92
SDQ Total Difficulties		
Child	0.79	0.82
Teacher	0.81	0.80
Parent	0.87	0.84
SDQ Prosocial		
Child	0.67	0.64
Teacher	0.77	0.73
Parent	0.72	0.74

Note: RCADS=Revised Child Anxiety and Depression Scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SDQ=Strengths and Difficulties Questionnaire.

Table S.4

Median and Range (Min, Max) for Evaluation Form Items by Participant Group

Question	Child[a]			Parent[b]			Teacher[c]		
	MBCT-C	FRIENDS	*p*	MBCT-C	FRIENDS	*p*	MBCT-C	FRIENDS	*p*
1 Overall program helpfulness	4 (1,5)	5 (3,5)	.02	4 (1,5)	4 (3,5)	.16	4 (3,5)	4 (3,5)	.56
2 Would recommend to others	4 (1,5)	4 (2,5)	.06	4 (2,5)	4 (2,5)	.88	4 (3,5)	4 (3,5)	>.99
3 Feel less worried	4 (1,5)	4 (1,5)	.52	4 (2,5)	3 (2,4)	.30	4 (3,4)	4 (3,5)	.6
4 Better able to manage my anger	4 (1,5)	4 (1,5)	.68	3 (1,5)	3 (1,4)	.93	3 (3,4)	3 (3,4)	>.99
5 More positive interactions	4 (2,5)	4 (1,5)	.53	4 (2,5)	4 (2,5)	.62	4 (3,4)	4 (2,5)	.71
6 More patient	4 (1,5)	4 (1,5)	.70	4 (2,5)	3 (1,5)	.11	3 (3,4)	3 (3,4)	.16
7 Helped me/my child in school	4 (1,5)	4 (1,5)	.85	3 (1,5)	4 (2,5)	.23	4 (3,5)	4 (3,4)	>.99
8 Helped me/my child at home	4 (1,5)	4 (1,5)	.62	4 (2,4)	4 (1,5)	.85	-	-	-
9 I will continue to practice mindful awareness after the program is over	4 (1,5)	-	-	-	-	-	-	-	-
10 How often did you talk to classmates about this program?	3 (1,5)	3 (1,5)	.62	-	-	-	-	-	-
11 I was aware of what my child was experiencing in the program	-	-	-	4 (1,5)	4 (1,5)	.96	4 (3,5)	4 (3,5)	>.99

Note. *p* value for child and parent forms is for Mann-Whitney *U*-test of difference between independent samples. *p* value for teacher form is for Wilcoxon Signed Ranked tests for repeated measures.

[a]. *n*=85 for questions 2, 6 and 8; *n*=84 for questions 3-5; *n*=82 for question 7; *n*=81 for question 10; *n*=78 for question 1.

[b]. *n*=56 for questions 1-3, 6-8, and 11; *n*=55 for question 5; *n*=53 for question 4.

[c]. *n*=19 for question 1; *n*=17 for questions 2-3; *n*=16 for question 4; *n*=15 for questions 5 and 6; *n*=14 for questions 7 and 11.

Table S.5

Mean (and Standard Deviation) for Participant Evaluation Form Questions

		CHILD		PARENT		TEACHER	
Question		MBCT-C	FRIENDS	MBCT-C	FRIENDS	MBCT-C	FRIENDS
1	Overall rating	4.03 (1.05)	4.50 (0.73)	3.52 (0.89)	3.88 (0.73)	3.85 (0.49)	3.79 (0.54)
2	Would recommend to others	3.60 (1.12)	4.07 (0.92)	3.90 (0.83)	3.88 (0.88)	3.81 (0.60)	3.94 (0.56)
3	Feel less anxious	3.86 (1.07)	4.00 (1.01)	3.42 (0.81)	3.28 (0.54)	3.62 (0.50)	3.71 (0.59)
4	Better able to manage anger	3.95 (1.19)	4.10 (1.03)	3.03 (0.94)	3.04 (0.81)	3.25 (0.44)	3.31 (0.48)
5	More positive interactions	4.00 (0.91)	3.88 (0.83)	3.47 (0.68)	3.56 (0.65)	3.73 (0.44)	3.67 (0.72)
6	More patient	3.74 (1.05)	3.86 (1.00)	3.37 (0.86)	3.04 (0.79)	3.38 (0.48)	3.47 (0.52)
7	Helped me/my child in school	3.88 (1.00)	3.90 (1.00)	3.26 (0.86)	3.56 (0.71)	3.71 (0.56)	3.73 (0.46)
8	Helped me/my child at home	3.79 (1.19)	3.95 (1.08)	3.45 (0.77)	3.40 (0.91)	-	-
9	I will continue to practice mindful awareness after the program is over	3.64 (1.10)	-	-	-	-	-
10	How often did you talk to classmates about this program?	2.85 (1.28)	3.00 (1.28)	-	-	-	-
11	I was aware of what my child was experiencing in the program	-	-	3.74 (0.73)	3.72 (0.84)	3.74 (0.56)	3.86 (0.53)

[a]. *n*=85 for questions 2, 6 and 8; *n*=84 for questions 3-5; *n*=82 for question 7; *n*=81 for question 10; *n*=78 for question 1.

[b]. *n*=56 for questions 1-3, 6-8, and 11; *n*=55 for question 5; *n*=53 for question 4.

[c]. *n*=19 for question 1; *n*=17 for questions 2-3; *n*=16 for question 4; *n*=15 for questions 5 and 6; *n*=14 for questions 7 and 11.

Table S.6

Mean (Standard Deviation), Median (Min, Max) and Mann-Whitney U-test for Facilitator Feedback Survey Items by Program

Question		*M* (*SD*)		*Mdn* (Range)		Mann-Whitney *U* Test				
		MBCT-C	FRIENDS	MBCT-C	FRIENDS	*U*	*n*	*z*	*p*	*r*
1	Overall, I thought this session worked well	4.02 (0.64)	4.13 (0.87)	4 (3,5)	4 (2,5)	2218.5	145	1.55	.12	.13
2	The children were engaged	3.84 (0.77)	4.06 (0.94)	4 (2,5)	4 (1,5)	2100.0	145	2.05	.04	.17
3	The children understood the content	3.77 (0.66)	4.29 (0.71)	4 (2,5)	4 (3,5)	1607.0	145	4.21	<.001	.35
4	I felt I had enough information to be fully prepared	4.47 (0.56)	4.83 (0.38)	5 (3,5)	5 (4,5)	1706.5	145	4.31	<.001	.36
5	I had the materials I needed	4.71 (0.52)	4.77 (0.42)	5, (3,5)	5 (4,5)	2479.0	145	0.51	.61	.04
6	I felt comfortable with this session	4.24 (0.76)	4.35 (0.82)	4 (2,5)	4 (1,5)	2315.0	145	1.13	.26	.09
7	The session content (length) was	3.44 (0.94)	3.04 (0.57)	3 (1,5)	3 (1,4)	3143.5	144	-2.93	.003	-.24
8	Home/Family practices were completed by...	2.34 (0.90)	1.81 (0.97)	2, (1,5)	2 (0,4)	2724.0	131	-2.94	.003	-.26
9	The children appeared to engage with the Home/Family Practices	2.53 (1.03)	2.11 (0.91)	3, (1,4)	2 (1,4)	2603.5	131	-2.35	.02	-.21

Note: A 5-point Likert-style scale was used for all responses. For Questions 1-6 and 9, responses were rated from 1 (strongly disagree) to 5 (strongly agree). For question 7, responses were from 1 (much too short), to 5 (much too long). For question 8 responses were rated from 1 (no-one) to 5 (everyone). Response rate was n=83 for FRIENDS and n=62 for MBCT-C.). Effect size $r = Z/\sqrt{N}$, interpreted as small = 0.1, medium = 0.3, and large = 0.5 (Field, 2009, p. 234).

Table S.7

Cumulative Number of Sessions Attended by Program

	MBCT-C		FRIENDS	
No. Sessions	*n*	%	*n*	%
1	45	100	44	100
2	45	100	43	98
4	45	100	41	93
5	44	98	41	93
6	43	96	39	89
7	40	89	38	86
8	38	84	34	77
9	30	67	23	52
10	21	47	10	23

Table S.8

Spearman Correlation Coefficients

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 RCADS-A	r_s															
	p															
	n															
2 RCADS-D	r_s	.72**														
	p	<.001														
	n	173														
3 CAMM	r_s	-.67**	-.55**													
	p	<.001	<.001													
	n	173	173													
4 ACS	r_s	-.49**	-.61**	.38**												
	p	<.001	<.001	<.001												
	n	173	173	173												
5 CYRM-12	r_s	-.17*	-.34**	-0.02	.31**											
	p	.03	<.001	.83	<.001											
	n	173	173	173	173											
6 PQOL	r_s	-.40**	-.59**	.26**	.43**	.67**										
	p	<.001	<.001	<.001	<.001	<.001										
	n	173	173	173	173	173										
7 SAT-Domain	r_s	-0.15	-0.11	0.04	0.08	0.09	-0.01									
	p	.07	.18	.60	.32	.29	.92									
	n	150	150	150	150	150	150									

Table continues

Table S.8 continued

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8 SAT-RT	r_s	0.09	0.12	-0.09	-0.07	0.02	-0.03	-0.06								
	p	.26	.16	.29	.38	.80	.70	.45								
	n	150	150	150	150	150	150	151								
9 CPT-Domain	r_s	-0.11	-0.08	0.05	0.11	0.11	0.10	.25**	0.03							
	p	.18	.34	.54	.17	.15	.20	<.01	.69							
	n	161	161	162	161	161	161	143	143							
10 CPT-RT	r_s	0.07	0.05	-0.12	-0.11	-0.09	-0.05	-.41**	0.11	-.37**						
	p	.35	.57	.14	.16	.27	.50	<.001	.19	<.001						
	n	161	161	162	161	161	161	143	143	163						
11 SDQ Total	r_s	.51**	.49**	-.41**	-.54**	-.36**	-.47**	-0.06	-0.05	-.30**	0.01					
Difficulties, Child	*p*	<.001	<.001	<.001	<.001	<.001	<.001	.51	.57	<.001	.92					
	n	171	171	172	171	171	171	148	148	160	160					
12 SDQ Total	r_s	0.07	.15*	0.13	-0.11	-.28**	-.24**	-.19*	0.02	-.18*	0.06	.29**				
Difficulties, Teacher	*p*	.34	.04	.08	.16	<.001	<.01	.02	.80	.02	.45	<.001				
	n	170	170	171	170	170	170	149	149	160	160	169				
13 SDQ Total	r_s	.23**	.22**	-0.02	-.27**	-0.07	-0.15	-.22*	0.13	-.24**	0.04	.50**	.39**			
Difficulties, Parent	*p*	.01	.01	.78	<.01	.45	.09	.02	.17	.01	.69	<.001	<.001			
	n	136	136	137	136	136	136	117	117	128	128	137	136			
14 SDQ Prosocial, Child	r_s	-.15*	-.21**	-0.01	.23**	.35**	.31**	-0.06	0.12	0.04	.28**	-.37**	-.18*	-.18*		
	p	.05	.01	.90	<.01	<.001	<.001	.46	.16	.63	<.001	<.001	.02	.03		
	n	171	171	172	171	171	171	148	148	160	160	172	169	137		

Table continues

Table S.8 continued

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15 SDQ Prosocial, Teacher	r_s	-0.05	-0.07	-.17*	-0.05	.29**	0.14	0.07	0.02	0.13	0.04	-0.13	-.57**	-.26**	.26**	
	p	.49	.38	.03	.49	<.001	.07	.36	.79	.11	.61	.09	<.001	<.01	<.001	
	n	171	171	172	171	171	171	150	150	161	161	170	172	137	170	
16 SDQ Prosocial, Parent	r_s	-0.05	-0.11	-0.05	0.09	.19*	.19*	-0.10	0.09	0.03	0.17	-.21*	-.25**	-.33**	.35**	.32**
	p	.58	.20	.59	.31	.03	.03	.28	.35	.70	.05	.02	<.01	<.001	<.001	<.001
	n	136	136	137	136	136	136	117	117	128	128	137	136	138	137	137

*p< .05. **p< .01

Note: RCADS=Revised Child Anxiety and Depression scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses (seconds); CPT=Continuous Performance Test; SDQ=Strengths and Difficulties Questionnaire.

Table S.9

Variations on Planned Session Content

Measure	MBCT-C	FRIENDS
Sessions with at least one practice/activity omitted	*n*=17	*n*=15
Sessions impacted by disruptive behaviour[1]	*n*=1	*n*=2
Frequency of practice/activities omitted	*n*=15 omitted one 3-minute breathing space	*n*=12 omitted one activity
	n=2 omitted one 3-minute breathing space and one other practice	*n*=2 omitted two activities
		n=1 omitted three activities

[1]. Sessions impacted by disruptive behaviour are included within numbers for "Sessions with at least one practice/activity omitted"

CONSORT 2010 checklist of information to include when reporting a randomised trial*

Section/Topic	Item No	Checklist item	Reported on page No
Title and abstract			
	1a	Identification as a randomised trial in the title	69
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	68
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	69-74
	2b	Specific objectives or hypotheses	73-74
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	74
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	76
Participants	4a	Eligibility criteria for participants	75
	4b	Settings and locations where the data were collected	74
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	76
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	79
	6b	Any changes to trial outcomes after the trial commenced, with reasons	-
Sample size	7a	How sample size was determined	82
	7b	When applicable, explanation of any interim analyses and stopping guidelines	-

Table continues

CONSORT 2010 checklist continued

Section/Topic	Item No	Checklist item	Reported on page No
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	82
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	82
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	82
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	82
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	83
	11b	If relevant, description of the similarity of interventions	78
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	83
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	83
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	84, 90
	13b	For each group, losses and exclusions after randomisation, together with reasons	84
Recruitment	14a	Dates defining the periods of recruitment and follow-up	87
	14b	Why the trial ended or was stopped	-
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	87, 90
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	90, 97, 110

Table continues

CONSORT 2010 checklist continued

Section/Topic	Item No	Checklist item	Reported on page No
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	90, 92, 94, 97
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	-
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	-
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	87
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	100-101
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	101
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	98
Other information			
Registration	23	Registration number and name of trial registry	-
Protocol	24	Where the full trial protocol can be accessed, if available	-
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	-

*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see www.consort-statement.org.

CHAPTER 4. PAPER THREE

Three- and six-month follow-up of a randomized controlled trial of MBCT-C for the prevention of internalizing difficulties in Australian primary school children

4.1 Preamble

This manuscript describes the implementation and analysis of the 3- and 6-month follow-up data for the randomised controlled trial. This study included implementation of two booster sessions for MBCT-C and CBT.

4.2 Statement of Authorship

Title of Paper	Three- and six-month follow-up of a randomized controlled trial of MBCT-C for the prevention of internalizing difficulties in Australian primary school children
Publication Status	Submitted for publication
Publication Details	Journal of Child and Family Studies

Principal Author

Name of Principal Author (Candidate)	Kathleen Wright
Contribution to the Paper	Reviewed the literature and formed the research idea. Planned and implemented the research, including gaining ethical approvals, liaising with schools, recruiting MBCT-C and CBT facilitators, obtaining informed consent from participants, data collection, and statistical analysis. Responsible for writing and editing the manuscript in collaboration with research supervisors. Submitted the manuscript to the journal. Corresponding author for the paper.
Overall percentage	90%
Certification	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.
Signature	
Date	

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);
ii. permission is granted for the candidate in include the publication in the thesis; and
iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Authors	Associate Professor Rachel Roberts Dr Michael Proeve	
Contribution to the Paper	Supervisors of the PhD research program. Oversaw the research idea conceptualisation and planning. Provided training and clinical supervision to the program facilitators. Collaborated in developing the content and structure of the publication manuscript, and reviewing drafts. Provided advice and guidance for responding to journal reviewer feedback.	
Signatures	Rachel Roberts	Michael Proeve
Date		

4.3 Submitted Manuscript

Title Page

Manuscript Title: Three- and six-month follow-up of a randomized controlled trial of MBCT-C for the prevention of internalizing difficulties in Australian primary school children

Running Head: CHAPTER 4. RCT FOLLOW-UP AT 3- AND 6-MONTHS

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Trial Registration: Registration of this trial was not prospectively applied for, as ethics approval was provided prior to 2014 when trial registration became a mandatory condition of ethics approval for all Australian trials (Askie L. M et al., 2017). However, retrospective registration has been applied for through the ANZCTR in June 2017.

Role of the funding source: This research was conducted as part of a PhD in Psychology within the University of Adelaide. No other funding was received.

Compliance with Ethical Standards: Approvals were provided by the University of Adelaide's Human Research Ethics Committee, the South Australian Department of Education and Child Development, and the Catholic Education Office. All adult participants provided informed written consent. Parents/Guardians provided consent for their child, and children provided assent.

Conflicts of interest: The authors declare that there are no conflicts of interest.

Competing interests: The authors declare that there are no competing interests.

Abstract

Little is known about duration of effects of mindfulness-based interventions (MBIs) for children, as few studies have included follow-up data compared to active controls in randomized controlled trials (RCT). Mindfulness-Based Cognitive Therapy for Children (MBCT-C) is a small-group MBI originally developed for anxious children aged 9-12 years. This study describes 3- and 6-month follow-up data for a RCT of MBCT-C as a preventive intervention for children experiencing internalizing difficulties (*n*=89; mean age=10.6 years), conducted within Australian primary schools (*n*=3). An established cognitive behaviour therapy (CBT) program was used as an active control. At baseline, children were randomized to program group (MBCT-C or CBT) within schools. In this study, two booster sessions were implemented between completion of the 10-week program and the 3-month follow-up. Multi-level mixed models analysed between- and within-group effects. Measures included mental health strengths and difficulties and attention. There were no between-group differences at 6-month follow-up. Within-group effect sizes at 6-month follow-up (compared to baseline) were similar for both programs, and suggest that where change was seen from pre- to post-intervention, there was continued improvement. The greatest within-group effects at 6-months (compared to baseline) for both programs were large-very large for shifting attention; large for anxiety and depression; and moderate-large for attention control. This study provides unique follow-up data for MBCT-C compared to an active control condition. The findings provide further evidence that MBCT-C is an appropriate, clinically-oriented preventive program that may be implemented in schools for children with internalizing difficulties.

Keywords: Mindfulness; MBCT-C; Children; Attention; Anxiety

Three- and six-month follow-up of a randomized controlled trial of MBCT-C for the prevention of internalizing difficulties in Australian primary school children

Anxiety and depression are amongst the most prevalent difficulties of childhood (defined as people less than 18 years of age). Cognitive behavioral therapy (CBT) has the largest evidence base for anxiety and depression in childhood, and some CBT programs have also demonstrated effectiveness in preventing mental health difficulties (e.g. the FRIENDS program; Barrett et al., 2006). However, not all children respond to CBT, and those who do respond may suffer a deterioration in symptoms in the future (Kendall, Peterman, & Cummings, 2015). Mindfulness-based interventions (MBIs) have emerged as an alternative, and have been used to both prevent and treat mental health difficulties in children. Within the adult literature, there are known effects for programs such as Mindfulness-Based Cognitive Therapy (MBCT) for preventing relapse of depression (Kuyken, Warren, Taylor, & et al., 2016), and Mindfulness-Based Stress Reduction (MBSR) for reducing symptoms of anxiety, depression, and stress (Khoury et al., 2015). For children, although there has been a rapid increase in publication of studies assessing MBIs, the literature is not as advanced as it is for adults. The majority of MBI research with children has been with universal interventions in schools (Zoogman et al., 2015). Other MBIs take a therapy-based approach, aiming to improve symptoms of difficulty such as anxiety and depression in children who either meet diagnostic criteria, or are at risk of developing a mental illness (Zoogman et al., 2015). Reviews of MBIs suggest that they are "probably efficacious" overall, recommending a need for randomized controlled trials (RCTs) using active controls, with follow-up data beyond post-intervention (Felver et al., 2016; Zenner et al., 2014; Zoogman et al., 2015). Providing follow-up data is important in evaluation of a therapy program's effectiveness, as any effects seen immediately post-intervention may or may not be sustained, and different types of interventions may have different change trajectories in the longer term (Kendall et al., 2015).

Recent meta-analytic reviews have examined RCTs of preventive programs for children and adolescents at risk of developing anxiety or depression (P. J. Lawrence et al., 2017; Rasing et al., 2017; Werner-Seidler et al., 2017). Almost all interventions included in these reviews were CBT-based. The authors analysed the effectiveness of "selective" and "indicated" programs, which are commonly used in prevention studies. "Selective" means targeting population sub-groups with elevated risk of developing a mental disorder, e.g. because of factors such as having a parent with a mental illness, or living in a low socioeconomic region. "Indicated" means targeting the program for children who are already experiencing symptoms of mental illness, but are either not meeting diagnostic criteria, or have not been formally diagnosed (P. J. Lawrence et al., 2017). When including studies without active control conditions, the reviews found small reductions in anxiety and depression at post-intervention and follow-up, with moderate to large heterogeneity of effect sizes (i.e. effect sizes ranged from no effect, to very large effects). When considering only studies that used active control conditions, data were much more limited. Only one meta-analysis calculated a between-groups effect size for anxiety at post-intervention: This was calculated from five studies, and found to be very small and not statistically significant (P. J. Lawrence et al., 2017). Only three individual studies included in these reviews provided follow-up data compared to an active control condition, with between-group effect sizes at follow-up (3-, 6-, or 12-months) being either very small or no effect (P. J. Lawrence et al., 2017; Rasing et al., 2017; Werner-Seidler et al., 2017). Perhaps unsurprisingly, the reviews each concluded that further RCT data is necessary in this area, to better understand the effectiveness of prevention/early intervention programs beyond immediate post-intervention.

What limits the effectiveness of CBT with children is not yet known. Questions have been raised within the literature that (even with adaptions for children), some aspects of CBT may be beyond the cognitive development of children who have not yet gone through the physical, cognitive, and social maturation that occurs during the teenage years (Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012). For

example, it is argued by these authors that activities in CBT (such as cognitive restructuring and problem solving) require cognitive skills such as abstract and hypothetical reasoning, and/or to generalise a specific skill learned in therapy to different situations in everyday life, and some children may not yet have developed these capabilities. It is hypothesized that the cognitive processing required for mindfulness practices is much less complex, as there is no attempt to restructure or change thoughts (as there is in CBT). Instead, mindfulness practice involves repeatedly bringing one's attention to the present moment, and to notice what is present, without judgement, or attempting to change it (Black, 2015; Frankel et al., 2012; Venning et al., 2012; Vøllestad et al., 2012). This is thought to be an innate human capacity within us all, even during childhood (Creswell, 2017). Under this theory, if mindfulness practice is better suited to young children's developmental capabilities, and this leads to greater effects for MBIs compared to CBT, then it is likely that there would also be greater effect sizes during a follow-up period.

Mindfulness-Based Cognitive Therapy for Children (MBCT-C) is an MBI that was developed for children aged 9-12 years who are experiencing anxiety (Semple et al., 2010). During its development it was tested with children attending a remedial reading program in a low income, inner city area (Lee et al., 2008; Semple et al., 2010). A wait-list controlled trial with these children (n=25) collected three-month follow-up data for the group who first received the intervention, and found that the improvements in parent-rated attention problems seen from pre- to post-intervention were sustained at follow-up (Semple et al., 2010). A subsequent pilot study established feasibility with youth (n=10, age 9-16 years) with diagnosed anxiety at risk of developing bipolar disorder (Cotton et al., 2015), and including results of functional magnetic resonance imaging (fMRI) from pre- to post-participation (Strawn et al., 2016). None of these studies used an active control condition, and only the wait-list controlled trial provided follow-up data (Semple et al., 2010). Indeed, the effects of MBIs with children beyond the post-intervention time point has been examined in only a small number of studies. Of these, most compared

mindfulness to a wait-list control, rather than active control condition, and only a small number provided data beyond a 3-month post-intervention follow-up (Felver et al., 2016).

The current study reports follow-up data at 3- and 6-months post-intervention, for a RCT of Mindfulness-Based Cognitive Therapy for Children, implemented as an indicated prevention program (MBCT-C; Semple et al., 2010), conducted in three Australian primary schools (*n*=89, mean age 10.6 years; Wright, Roberts, & Proeve, under review). A well-established CBT program was used as an active control condition. Results were reported in (Wright, Roberts, & Proeve, article under review). The overall pattern of results showed a main effect of time (mostly small to moderate effects) and little difference between programs; however, change was not seen for all variables.

Given that so few studies have assessed the performance of prevention and early intervention programs for at-risk children, the current study aimed to explore the effects of MBCT-C beyond immediate post-intervention. Given the theory that MBIs may be more appropriate for children's developmental stage compared to CBT, the hypotheses were that MBCT-C would have greater effect sizes during the follow-up period compared to CBT, for: mental health difficulties; mental health strengths; mindfulness; and attention (i.e. within the follow-up period, participants in MBCT-C would have greater reductions in mental health difficulties, and greater improvements in mental health strengths, mindfulness, and attention, compared to participants in CBT).

Method

Ethics approval was provided by the University of Adelaide's Human Research Ethics Committee. Approvals were also provided by the Department of Education and Child Development, and the Catholic Education Office (South Australia). A full description of methods is provided in (Wright, Roberts, & Proeve, article under review). A summary of previously reported methods is provided, as well as new information regarding the booster sessions and follow-up data collection.

Research Design

The research design was a two (program) by four (pre-test, post-test, 3-month, and 6-month post-intervention follow-up) mixed factorial design. Children were randomly allocated to program group at baseline, using random permuted blocks, with stratification by school, gender, and age. Randomization was completed by the principal researcher on a blind (de-identified) basis. Within schools there were no attempts to conceal which program a child was allocated to. A younger and older group was run for each program in each school, a total of four groups per school. There were no changes to the allocation of children to groups after the 10-week program, they participated in booster sessions in their original groups.

Participants

Children (*n*=89), their parent/guardians, and teachers from three primary schools in South Australia were enrolled at baseline. Children's ages ranged from 8-13 (mean age 10.6, *SD*=1.1); they were from Years 4-7, and 50.5% were female. One school was located in an inner metropolitan area. The other two schools were located in satellite towns, one classified as regional and the other metropolitan.

Nomination was predominantly by teachers, but parents could also nominate their child. Informed written consent was required by all adult participants (parents/guardians, and teachers), and informed assent was provided by children. Nomination criteria included a child appearing very shy, withdrawn, displaying anxiety or worry, being generally very quiet or down. Children eight or younger (and not turning nine within the research period), or older than 12 were excluded, except for one child who was already 13 but in a year 7 class, and was included. Other exclusion criteria included presence of a developmental disorder likely to significantly impede a child's ability to learn new concepts or experience emotions (such as Down Syndrome); however, two children with a DSM-IV diagnosis of Asperger's Syndrome who were considered to be high-functioning were included.

Programs and Boosters

All sessions including boosters were held during school hours at school. Within the original RCT, one session per program was held each week, for 10 weeks in school Term 2 (April to June, 2014). The group facilitators for the booster sessions were the same as for the original program. Facilitators were Masters-level provisionally registered Psychologists (registered with the Australian Health Practitioner Regulation Agency), and received credit towards their Masters qualification. Two senior academic Clinical Psychologists provided supervision (one per program).

As the MBCT-C program content does not include booster sessions, the timing and frequency of the selected CBT program's boosters was used as a guide. An equal number of boosters was provided for each program. Booster session one was held during weeks 5-6 of Term 3 (approximately 7-8 weeks after completion of the 10-week program), and booster session two was held during weeks 9-10 of Term 3 (approximately 11-12 weeks following completion of the 10-week program), followed by the 3-month follow-up testing.

A summary of activities used in each program's booster session is provided in Supplement 1, Table S.1 (page 151). To standardize program delivery, facilitators were asked to deliver the program material as instructed. If anything affected the booster program delivery they were asked to report it to the research team.

MBCT-C. Session content for MBCT-C boosters was developed by the research team based on activities from the core 10-week program. The aim was to help children refresh what they had learned, and encourage mindfulness practice in daily life. The structure of the booster sessions was the same as that used in the main program.

FRIENDS for Life. The CBT program selected was FRIENDS for Life (FRIENDS; Barrett, 2012), which aims to prevent and treat anxiety and depression in 8-12 year old children. The FRIENDS manual for facilitators and children contains details of two booster sessions that have a number of activities to choose from(Barrett, 2012).

For consistency in implementation, the research team selected one set of activities for implementation in all groups (see Supplement 1, Table S.1, page 151).

Outcome Measures

The measures used, and procedure for administering measures, were consistent with the pre- to post-intervention implementation (except the program evaluation forms, which were not re-administered). Measures were completed at school, during class time, in small groups or individually, under supervision of the lead researcher. The objective measures of attention were completed on one of two identical laptops. Cronbach's α for the 3- and 6-month follow-up measures are provided in Supplement 1, Table S.2 (page 152). All measures were selected on the basis of being suitable from age 9 years. Unless stated, measures were validated with non-clinical populations, to avoid ceiling or floor effects.

Anxiety and depression. The anxiety and depression sub-scales of the *Revised Child Anxiety and Depression Scale* (RCADS; Ebesutani et al., 2012) were used. The subscales have good validity and reliability in clinical and non-clinical populations of children, discriminating successfully between children with a diagnosis and healthy children. Internal consistency for the anxiety subscale (RCADS-A) ranged from .86 to .91, and for the depression subscale (RCADS-D) from .79 to .80 (Ebesutani et al., 2012).

Mindfulness. The *Child and Adolescent Mindfulness Measure* (CAMM) is a 10-item single-factor measure reflecting two related constructs: awareness of ongoing activity, and awareness of judgmental/avoidant responses to thoughts and feelings (Greco et al., 2011). It has adequate psychometric properties, with Cronbach's α=.81 (Greco et al., 2011).

Other mental health strengths and difficulties. The *total difficulties* (SDQ Total Difficulties; 20 items) and *prosocial behaviours* (SDQ Prosocial; 5-items) sub-scales of the SDQ were used (Goodman, Renfrew, & Mullick, 2000). Concurrent versions are available for children, parents/guardians, and teachers. The SDQ is widely used, with good psychometric properties including reliability and validity data for both

clinical and healthy populations (Goodman et al., 2000; Mellor, 2005). Coefficient α for the SDQ Total Difficulties and SDQ Prosocial subscales ranged from .62 and .83, with test-retest correlations between .69 to .84 (Mellor, 2005).

The *Child and Youth Resilience Measure* (CYRM-12; Liebenberg et al., 2013), and *Pediatric Quality of Life Enjoyment and Satisfaction Questionnaire* (PQOL; Endicott et al., 2006) are measures of mental health strengths (along with the SDQ Prosocial subscale). The CYRM-12 has satisfactory internal consistency (Cronbach's α=.84), and validation in both clinical and health samples (Liebenberg et al., 2013). The PQOL has 15-items, and has high internal consistency with Cronbach's α ranging from .87 to .90 (Endicott et al., 2006). The PQOL was developed for children who have experienced depression, and was selected as no other brief, psychometrically sound, open-source measures of quality of life were detected in literature searches.

Attention. The *Attention Control Scale* (ACS) measures an individual's perception of their ability to focus, sustain, and shift attention, with deliberate intent (Muris, Mayer, et al., 2008). The self-report scale has 20-items, with Cronbach's α between .70 to .81 (Muris, Mayer, et al., 2008). The *CNS Vital Signs* (Gualtieri & Johnson, 2006b) objective (computerised) tests of shifting and sustained attention were used. Both the shifting attention test (SAT) and continuous performance test (CPT) provide a reaction time measure for correct responses (SAT-RT, and CPT-RT), and a domain score (SAT-Domain, and CPT-Domain). Domain scores are calculated by subtracting errors from correct responses. CNSVS tests have built-in validity indicators. Invalid tests may reflect a lack of understanding of test instructions, very low motivation or effort, or clinical reasons for poor performance (such as a disability) which may require further investigation. The test publishers recommend that invalid tests are removed before analysing group-based trial data (CNS Vital Signs, personal communication, November 24, 2016).

Fidelity. The approach to fidelity within the boosters was continued on from the main program without changes. Facilitators were asked to record attendance, and

complete the facilitator session feedback survey that was developed for this research program. Questions included perceptions of how children reacted to the content, and their level of home practice. However, the response rate for the facilitator feedback survey was very low (less than 30%) and therefore is not reported.

Data Analysis

Power analysis was conducted before the main trial including the follow-up data points. It was based on: an estimate of three points as being clinically meaningful change in the primary measure of anxiety; a standard deviation of 4.33 for the change in anxiety scores from baseline to follow-up; Type-I error rate of .05; loss to follow-up of 5%; and an inflation factor (design effect) of 14% because of the clustering of children within intervention groups. This required a total of 41 children per program to be recruited.

Baseline descriptive statistics were previously reported (Wright, Roberts, & Proeve, article under review). All analyses were completed using SPSS version 21, with a Type I error rate of .05. Analysis was conducted on the "intent to treat" (i.e. enrolled) sample. Between- and within-groups analyses of mean scores were conducted utilising Multilevel Mixed Models (MLM) in SPSS, allowing for inclusion of missing data through maximum likelihood estimation. Time (pre-intervention, post-intervention, 3-month follow-up, and 6-month follow-up) and program (MBCT-C or FRIENDS) were entered as factors. Control variables were entered into the models as covariates, including age, gender, and number of sessions attended, but none were significant predictors, nor reduced residual variance, and therefore were not included in the final models. School was explored as a third hierarchical model level for each variable, but models either did not converge, or the level of variance at the third level (between-schools) was trivial (less than 5%) and/or not statistically significant. Therefore, the two-level model was progressed (repeated measures of time at level 1, individual child at level 2).

T scores were used to calculate the number of children with elevated RCADS-A and RCADS-D scores at each time point, using normative data (Ebesutani et al., 2012).

For the RCADS, children with T scores of 70 or greater are classified as being within the clinical range, and scores of 65-69 are considered "borderline" (Weiss & Chorpita, 2015). In addition to this, the Heaton-Barton NAB classification of "above average" (T score above 55) was used (Iverson, 2011) to include children with elevated symptoms of anxiety or depression who may be at risk of developing a future mental disorder. For missing data, that child's last known T score was carried forward. Results were tabled by program and time point.

Results

Participant Flow

The CONSORT flow diagram, extended for the 3- and 6-month follow-up time points is provided in Figure 1 (page 133). Reasons for withdrawal after the post-intervention time point included a child feeling that participating in the boosters and testing sessions was interfering with her school work (*n*=1; MBCT-C), a child not enjoying the program (*n*=1; FRIENDS), and children changing schools (*n*=1 for MBCT-C; *n*=2 for FRIENDS). Missing data included the children who withdrew, invalid CNSVS tests, and parent and teacher SDQ forms that were not returned. Data was also missing at each time point for a small number of children who were not available for testing, due to extended absence for illness/family holiday.

Booster Sessions

Session content was implemented as planned, and there were no missed activities. Attendance for MBCT-C was 86% (*n*=37) for Booster 1, and 85% (*n*=34) for Booster 2. Attendance for FRIENDS was 67% (*n*=28) for Booster 1, and 58% (*n*=22) for Booster 2. At the time of Booster 2 there were a number of children absent from school due to illness or family holidays. There were no adverse events or side effects reported.

Preliminary Analysis

Descriptive statistics for the 3- and 6-month follow-up time points are provided in Table 1 (page 134).

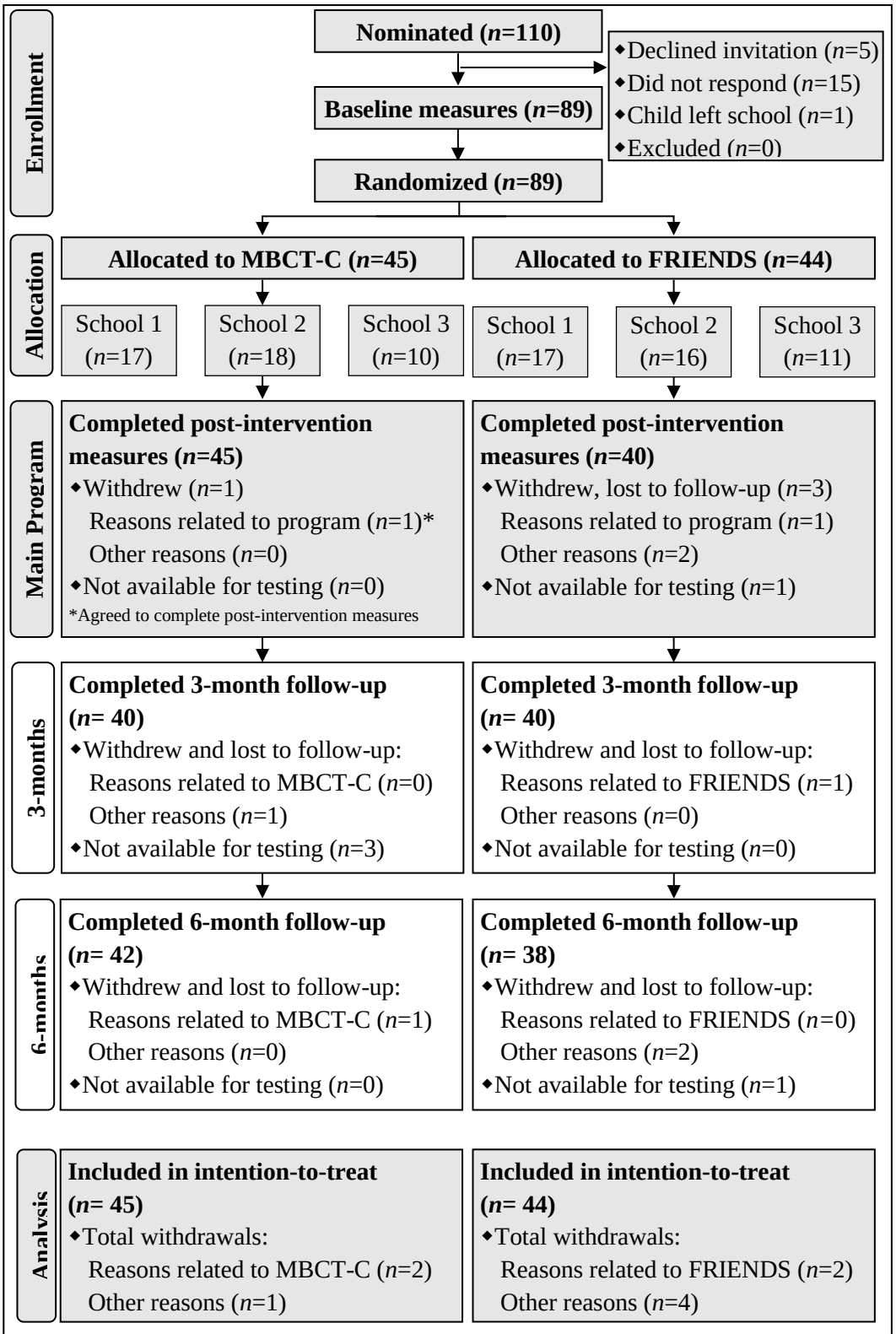

Figure 1. CONSORT Flow Diagram

Table 1

Descriptive Statistics at 3- and 6-Month Follow-up Time Points

	MBCT-C						FRIENDS					
	3-month			6-month			3-month			6-month		
Measure	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
RCADS-A	40	11.59	7.26	42	10.70	7.26	40	11.68	7.85	37	9.28	6.73
RCADS-D	40	8.30	5.86	42	7.38	5.65	40	7.52	4.73	37	6.46	5.03
CAMM	40	26.71	7.22	42	26.43	6.37	40	27.41	5.74	37	27.95	6.16
ACS	40	33.76	10.50	42	35.12	11.89	40	32.57	9.61	37	34.35	10.58
CYRM-12	40	45.10	11.16	42	45.08	12.61	40	46.11	9.08	37	48.84	8.55
PQOL	40	58.45	12.45	42	58.99	13.15	40	59.43	8.63	37	62.37	9.75
SAT-Domain	36	28.36	14.01	38	35.11	13.36	38	33.32	10.16	37	35.03	13.24
SAT-RT	36	1.10	0.17	38	1.07	0.16	38	1.11	0.13	37	1.08	0.13
CPT-Domain	37	34.49	3.83	36	35.03	4.45	33	33.46	4.91	36	34.33	4.33
CPT-RT	37	0.49	0.07	36	0.48	0.06	33	0.50	0.05	36	0.50	0.06

Table continues

Table 1 continued

	MBCT-C						FRIENDS					
	3-month			6-month			3-month			6-month		
Measure	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
SDQ Total Difficulties												
Child	41	12.46	5.87	42	11.82	6.69	40	13.35	6.64	37	11.27	5.94
Teacher	26	9.19	6.82	33	8.58	5.84	26	10.02	6.64	33	8.19	6.33
Parent	21	10.86	6.36	24	9.80	7.12	22	10.55	4.79	22	9.86	5.39
SDQ Prosocial												
Child	41	7.76	2.14	42	7.77	1.93	40	7.46	1.79	37	7.69	1.85
Teacher	26	7.81	2.17	33	8.00	1.92	26	7.50	2.42	32	7.42	2.35
Parent	21	8.14	1.62	24	8.44	1.93	22	9.08	1.12	22	8.55	1.57

Note: RCADS=Revised Child Anxiety and Depression Scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses, in seconds; CPT=Continuous Performance Test; SDQ=Strengths and Difficulties Questionnaire.

Mental Health Strengths and Difficulties

There was only one statistically significant difference between groups (Table 2, page 138), the SDQ Prosocial subscale for parents at the 3-month follow-up point (moderate to large effect), but this difference was not present at the 6-month follow-up time point. The within-groups analysis (Table 3, page 140) of 3- and 6-month follow-up compared to post-intervention suggest that during the follow-up period, FRIENDS had greater within-group effect sizes than MBCT-C for the RCADS-A, RCADS-D, CYRM-12, and PQOL. However, when compared to baseline, within-groups effects at 6-month show that overall effects were similar for both programs: large for anxiety and depression; moderate for quality of life; moderate-to-large for the parent and teacher SDQ Total Difficulties, and teacher's SDQ Prosocial scales; and small for FRIENDS children's SDQ Total Difficulties scale. At 6-months compared to baseline there were no statistically significant within-group effects for the children's and parent's SDQ Prosocial scores, or MBCT-C children's SDQ Total Difficulties scores. For the resilience measure there was a large statistically significant improvement for the FRIENDS group, but no statistically significant change for the MBCT-C group.

The proportion of children with elevated anxiety, and the proportion of children with elevated depression, are displayed in Table 5 (page 144), for each time point. The reduction in children with elevated anxiety was 53% for MBCT-C and 47% for FRIENDS. For depression it was a 63% reduction for MBCT-C, and 44% for FRIENDS. The proportion of children with either elevated anxiety or depressive symptoms was also tabulated (to indicate the total number of children with above average symptoms of internalizing difficulties): 54% at baseline (*n*=27 MBCT-C; *n*=21 FRIENDS); 38% post-intervention (*n*=17 MBCT-C; *n*=17 FRIENDS); 30% at 3-month follow-up (*n*=14 MBCT-C; *n*=13 FRIENDS); and 26% at 6-month follow-up (*n*=11 MBCT-C; *n*=12 FRIENDS). For MBCT-C the reduction in the number of children with above average internalizing symptoms was 59% (*n*=16), and for FRIENDS it was 43% (*n*=9).

Mindfulness and Attention

There were no between-groups differences found for mindfulness or attention measures (Table 2, page 138). Within-group effect sizes are displayed in Table 4 (page 142). Compared to post-intervention, the CAMM had moderate statistically significant within-group effects for FRIENDS, but no effect for MBCT-C. However, within-group effect sizes on the CAMM at 6-months compared to baseline were moderate for both programs. Effect sizes for the attention variables at 6-months compared to baseline were similar for each program. An exception to this was the CPT-RT, where a small statistically significant improvement was present for the MBCT-C group at 6-months compared to baseline, but no change (no effect) for FRIENDS. Effect sizes at 6-months compared to baseline for both programs were: large for ACS; very large for SAT-Domain; large for SAT-RT; moderate for CPT-Domain.

Table 2

Between-Group Effect Sizes

	3-month follow-up					6-month follow-up				
Measure	*MD*	*SE*	*df*	95% CI	*d*	*MD*	*SE*	*df*	95% CI	*d*
Mental health strengths & difficulties										
RCADS-A	-0.06	1.42	332.0	[-2.85, 2.72]	-0.01	0.98	1.42	332.0	[-1.82, 3.79]	0.16
RCADS-D	0.75	1.00	325.6	[-1.21, 2.72]	0.17	0.63	1.00	326.0	[-1.34, 2.61]	0.14
CYRM-12	-0.57	1.90	322.8	[-4.30, 3.16]	-0.07	-3.12	1.91	323.4	[-6.87, 0.64]	-0.37
PQOL[a]	-0.91	2.28	138.1	[-5.42, 3.60]	-0.09	-2.88	2.29	140.4	[-7.42, 1.65]	-0.28
SDQ Total Difficulties										
Child	-1.09	1.20	328.5	[-3.45, 1.27]	-0.20	0.48	1.21	328.6	[-1.90, 2.85]	0.09
Parent[a]	0.98	1.72	167.8	[-2.41, 4.37]	0.17	0.62	1.69	161.6	[-2.72, 3.96]	0.11
Teacher[a]	-0.09	1.41	174.7	[-2.87, 2.69]	-0.02	-0.11	1.34	150.9	[-2.76, 2.53]	-0.02
SDQ Prosocial										
Child	0.36	0.39	303.0	[-0.40, 1.12]	0.21	0.16	0.39	304.8	[-0.60, 0.92]	0.09
Parent [a]	-1.05*	0.47	191.5	[-1.97, -0.13]	-0.66	-0.33	0.46	185.3	[-1.23, 0.57]	-0.21
Teacher	-0.03	0.55	185.1	[-1.10, 1.05]	-0.01	0.33	0.52	160.1	[-0.70, 1.35]	0.16

Table continues

Table 2 continued

	3-month follow-up					6-month follow-up				
Measure	*MD*	*SE*	*df*	95% CI	*d*	*MD*	*SE*	*df*	95% CI	*d*
Mindfulness and attention										
CAMM	-0.80	1.38	314.7	[-3.52, 1.92]	-0.13	-1.56	1.39	315.7	[-4.29, 1.18]	-0.25
ACS	1.35	1.93	331.3	[-2.44, 5.14]	0.16	0.91	1.94	331.4	[-2.90, 4.72]	0.11
SAT-Domain	-4.26	2.60	278.3	[-9.38, 0.85]	-0.38	0.45	2.57	277.8	[-4.62, 5.52]	0.04
SAT-RT	-0.00	0.04	285.9	[-0.07, 0.07]	-0.01	0.00	0.04	285.6	[-0.06, 0.07]	0.03
CPT-Domain	1.45	1.40	273.7	[-1.31, 4.20]	0.25	0.88	1.38	271.9	[-1.84, 3.59]	0.15
CPT-RT	-0.01	0.01	301.6	[-0.03, 0.02]	-0.15	-0.02	0.01	301.6	[-0.04, 0.00]	-0.39

Note. MD=Mean difference (MBCT-C minus FRIENDS); RCADS=Revised Child Anxiety and Depression Scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses (seconds); CPT=Continuous Performance Test; SDQ=Strengths and Difficulties Questionnaire.

[a]. Model did not include a random intercept for time

*. $p<.05$

Table 3

Within-Group Effect Size Estimates at Follow-up for Mental Health Difficulties and Strengths

		3 month vs. post-intervention			6 month vs. post-intervention			3 months vs. baseline			6 months vs. baseline		
Measure	Program	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*
RCADS-A	M	-0.64	[-2.61, 1.32]	0.10	-1.57	[-3.51, 0.36]	0.25	-3.92*	[-5.88, -1.96]	-0.61	-4.85*	[-6.78, -2.92]	-0.76
	F	-2.52*	[-4.26, -0.24]	0.35	-4.23*	[-6.29, -2.17]	0.67	-3.61*	[-5.60, -1.61]	-0.56	-5.58*	[-7.63, -3.54]	-0.87
RCADS-D	M	-0.31	[-1.72, 1.10]	-0.07	-1.19	[-2.58, 0.19]	-0.26	-2.68*	[-4.09, -1.27]	-0.59	-3.56*	[-4.95, -2.17]	-0.79
	F	-1.48*	[-2.93, -0.03]	-0.33	-2.24*	[-3.73, -0.76]	-0.50	-2.23*	[-3.66, -0.80]	-0.49	-3.00*	[-4.47, -1.53]	-0.67
CYRM-12	M	0.92	[-1.80, 3.64]	0.11	0.93	[-1.75, 3.61]	0.11	2.05	[-0.67, 4.77]	0.24	2.05	[-0.63, 4.73]	0.24
	F	0.66	[-2.13, 3.45]	0.08	3.21*	[0.35, 6.07]	0.38	3.31*	[0.55, 6.07]	0.38	5.86*	[3.03, 8.69]	0.69
PQOL[a]	M	1.03	[-1.22, 3.28]	0.10	1.59	[-0.63, 3.82]	0.15	4.95*	[2.70, 7.20]	0.47	5.51*	[3.29, 7.74]	0.53
	F	0.90	[-1.42, 3.21]	0.09	3.43*	[1.06, 5.81]	0.34	1.55	[-0.76, 3.85]	0.15	4.08*	[1.72, 6.45]	0.39
SDQ Total Difficulties													
Child	M	-0.11	[-1.78, 1.56]	-0.02	-0.49	[-2.14, 1.16]	-0.09	-0.80	[-2.48, 0.87]	-0.15	-1.19	[-2.83, 0.46]	-0.22
	F	0.40	[-1.31, 2.11]	0.07	-1.55	[-3.30, 0.21]	-0.29	0.19	[-1.53, 1.90]	0.03	-1.76*	[-3.52, -0.01]	-0.33
Parent[a]	M	-0.10	[-2.12, 1.92]	-0.02	-0.99	[-2.90, 0.92]	-0.17	-2.91*	[-4.87, -0.95]	-0.46	-3.80*	[-5.66, -1.93]	-0.60
	F	-1.17	[-3.23, 0.88]	-0.20	-1.71	[-3.75, 0.33]	-0.29	-2.28*	[-4.21, -0.35]	-0.36	-2.81*	[-4.74, -0.88]	-0.44
Teacher[a]	M	0.34	[-1.18, 1.86]	0.06	-0.80	[-2.19, 0.59]	-0.14	-2.04*	[-3.56, -0.52]	-0.36	-3.17*	[-4.56, -1.79]	-0.56
	F	1.19	[-0.33, 2.70]	0.21	0.07	[-1.32, 1.47]	0.01	-2.42*	[-3.93, -0.90]	-0.43	-3.53*	[-4.92, -2.14]	-0.61

Table continues

Table 3 continued

		3 month vs. post-intervention			6 month vs. post-intervention			3 months vs. baseline			6 months vs. baseline		
Measure	Program	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*
SDQ Prosocial													
Child	M	-0.06	[-0.61, 0.49]	-0.03	-0.02	[-0.56, 0.52]	-0.01	-0.25	[-0.80, -0.30]	-0.14	-0.21	[-0.75, 0.33]	-0.12
	F	-0.29	[-0.86, 0.27]	-0.17	-0.06	[-0.64, 0.52]	-0.03	-0.67*	[-1.23, -0.10]	-0.38	-0.43	[-1.01, 0.15]	-0.25
Parent[a]	M	-0.06	[-0.66, 0.55]	-0.03	0.24	[-0.34, 0.81]	0.13	0.21	[-0.38, 0.80]	0.12	0.50	[-0.06, 1.06]	0.31
	F	0.53	[-0.09, 1.15]	0.28	0.10	[-0.52, 0.71]	0.05	0.87*	[0.29, 1.45]	0.51	0.44	[-0.14, 1.02]	0.26
Teacher[a]	M	0.75*	[0.13, 1.37]	0.35	0.75*	[0.18, 1.31]	0.34	1.33*	[0.72, 1.95]	0.61	1.33*	[0.76, 1.89]	0.60
	F	0.83*	[0.21, 1.45]	0.39	0.47	[-0.11, 1.04]	0.22	1.50*	[0.88, 2.12]	0.69	1.14*	[0.57, 1.71]	0.52

Note. MD=Mean difference; RCADS=Revised Child Anxiety and Depression Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SDQ=Strengths and Difficulties Questionnaire.

[a]. Model did not include a random intercept for time

*. $p<.05$

Table 4

Within-Group Effect Size Estimates at Follow-up Time Points for Mindfulness and Attention

		3 month vs. post-intervention			6 month vs. post-intervention			3 month vs. baseline			6 month vs. baseline		
Measure	Program	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*	*MD*	95% CI	*d*
CAMM	M	0.58	[-1.36, 2.53]	0.09	0.22	[-1.69, 2.14]	0.04	2.56*	[0.62, 4.50]	0.41	2.20*	[0.29, 4.12]	0.35
	F	2.81*	[0.82, 4.80]	0.45	3.21*	[1.16, 5.25]	0.52	2.57*	[0.61, 4.53]	0.41	2.96*	[0.95, 4.97]	0.48
ACS	M	2.33	[-0.34, 5.01]	-0.27	3.45*	[0.82, 6.08]	0.40	5.18*	[2.50, 7.85]	0.59	6.29*	[3.66, 8.92]	0.72
	F	1.25	[-1.49, 3.99]	0.14	2.81	[0.00, 5.61]	0.33	3.45*	[0.73, 6.16]	-0.39	5.01*	[2.22, 7.79]	0.58
SAT													
Domain	M	1.44	[-2.53, 5.41]	0.13	7.83*	[3.96, 11.70]	0.70	8.19*	[4.13, 12.25]	0.74	14.58*	[10.64, 18.51]	1.31
	F	3.42	[-0.46, 7.30]	0.31	5.10*	[1.20, 8.99]	0.46	15.86*	[11.99, 19.73]	1.42	17.54*	[13.65, 21.42]	1.58
RT	M	-0.02	[-0.07, 0.03]	-0.12	-0.04	[-0.09, -0.01]	-0.28	-0.11*	[-0.17, -0.06]	-0.74	-0.14*	[-0.19, -0.08]	-0.90
	F	-0.08*	[-0.14, -0.03]	-0.53	-0.11*	[-0.17, -0.06]	-0.75	-0.11*	[-0.16, -0.06]	-0.74	-0.14*	[-0.19, -0.09]	-0.94
CPT													
Domain	M	1.30	[-0.75, 3.34]	0.22	1.62	[-0.42, 3.66]	0.28	2.75*	[0.76, 4.74]	0.46	3.08*	[1.07, 5.08]	0.52
	F	2.35*	[0.27, 4.42]	0.40	3.24*	[1.22, 5.26]	0.55	2.84*	[0.77, 4.92]	0.48	3.74*	[1.72, 5.75]	0.63
RT	M	0.00	[-0.01, 0.02]	0.07	0.00	[-0.02, 0.02]	0.01	-0.02	[-0.03, 0.00]	-0.29	-0.02*	[-0.04, 0.00]	-0.35
	F	0.00	[-0.02, 0.02]	0.04	0.01	[-0.01, 0.03]	0.21	-0.01	[-0.03, 0.01]	-0.17	0.00	[-0.02, 0.02]	0.00

Table continues

Table 4 continued

Note. MD=Mean difference. CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; SAT=Shifting Attention Test; Domain=correct responses minus errors; RT=average reaction time for correct responses (seconds); CPT=Continuous Performance Test; Program: M=MBCT-C, F=FRIENDS.

Table 5

Number of Children with Elevated Anxiety or Depressive Symptoms by Program and Time Point

Measure, Program, and Time Point	Above Average	Borderline Range	Clinical Range	Total Above Average
RCADS-A				
MBCT-C				
Baseline	9	9	1	19
Post-intervention	6	3	2	11
3-month follow-up	5	3	2	10
6-month follow-up	5	4	0	9
FRIENDS				
Baseline	8	6	5	19
Post-intervention	4	6	4	14
3-month follow-up	3	6	3	12
6-month follow-up	5	2	3	10
RCADS-D				
MBCT-C				
Baseline	9	10	5	24
Post-intervention	3	7	3	13
3-month follow-up	3	5	3	11
6-month follow-up	3	3	3	9
FRIENDS				
Baseline	4	11	1	16
Post-intervention	2	7	2	11
3-month follow-up	5	4	1	10
6-month follow-up	3	5	1	9

Note. T scores for "Above Average"=55-64; "Borderline Range"=65-69; "Clinical Range" ≥70; for missing data, the last known value was carried forward;

RCADS=Revised Child Anxiety and Depression Scale.

Discussion

The aim of this study was to explore the effects of MBCT-C as a preventive program for children with internalizing difficulties, during a 3- and 6-month follow-up period, when compared to a well-established CBT program. To our knowledge, this is a unique contribution for MBCT-C and also helps to fill a gap for the MBI and preventive interventions literature for children, as so few studies have provided follow-up data compared to an active control condition. Contrary to the hypotheses, there were no differences between-groups at the 3- and 6-month follow-up time points, except for one measure (Parent SDQ Prosocial) at 3-months post-intervention, and this difference was not present at the final time point. Within-group effect sizes at 6-months compared to baseline were similar for each program, and the broad pattern of results was that where change in a measure occurred, effect sizes strengthened over time. The greatest effects were at 6-months compared to baseline (for both programs), for shifting attention, symptoms of anxiety and depression, and attention control. These results provide further support for use of MBCT-C as a preventive program for internalizing difficulties in children.

Within the few studies that have compared an MBI to an active control condition beyond post-intervention, to our knowledge, none have used an "at-risk" (targeted or selective) sample. Three previous studies assessed follow-up data, and although the results are not directly comparable to due methodological differences, they provide some context for the current results. One RCT compared a universal MBI to usual curriculum in schools, for anxiety, depression, mindfulness, and self-esteem. It found no difference between-groups at 3-month follow-up, and no within-group difference between baseline and 3-month follow-up (Johnson et al., 2016). The former RCT was a universal trial, and the MBI was not a therapy-based program. It could be argued that in selecting children displaying signs of internalizing difficulties, and using a clinically-based program, the within-group effect sizes in the current study are larger than those found by Johnson et al. (2016). Two other RCTs applied MBIs in adolescent psychiatric out-patient

populations, for anxiety, depression, mindfulness, and self-esteem, comparing a therapy-based MBI plus treatment as usual (MBI + TAU), to TAU only (Biegel, Brown, Shapiro, & Schubert, 2009; Tan & Martin, 2015). These trials found moderate to large differences between-groups at 3-month follow-up, with large within-groups effects for the groups who participated in MBI + TAU, and negligible to small effects for the TAU only group. Within these two former RCTs, participants in MBI + TAU spent a greater amount of time in therapy compared to TAU, whereas in the current study, the two conditions were matched for time-in-program. This may go some way to explaining the former RCT's findings of larger between-group effects compared to the current study.

Reviews of the literature for preventive programs have also identified a scarcity of studies using active control conditions, although one review reported data from three individual studies which assessed CBT-based prevention programs for "at-risk" children, for anxiety and depression (P. J. Lawrence et al., 2017). Although not MBIs, the study design of these three RCTs are more directly comparable to the current study than the afore-mentioned MBI studies, given that they used therapy-based CBT programs compared to an active control (education programs or group-based activities), for "at risk" children. They found no between-groups differences at 3-, 6-, or 12-month follow-up, and within-groups effect sizes became larger during the follow-up period (Dobson, Hopkins, Fata, Scherrer, & Allan, 2010; Manassis et al., 2010; Rohde, Stice, Shaw, & Brière, 2014). Results of the current trial add support to these preventive study findings. Another review of CBT for prevention of anxiety and depression in at-risk populations calculated meta-analytic within-group effects, for the change in anxiety and depressive symptoms from baseline to follow-up. The pooled follow-up data for 3-6 months post-intervention showed small improvements for depression and anxiety, but there was no effect at 12-months. The results of the current study had greater within-group effect sizes for depression and anxiety; however, the previous findings also suggest that it would be wise for future studies to consider longer-term follow-up.

The lack of a between-groups difference in mindfulness is surprising, given that mindful practice is a core component of MBCT-C but not FRIENDS. The CAMM's single factor reflects a combination of awareness of ongoing activity, and awareness of judgmental/avoidant responses to thoughts and feelings (Greco et al., 2011). A possible explanation is that within the FRIENDS program, children are taught awareness of "red" (unhelpful) and "green" (helpful thoughts), and then practice strategies to change unhelpful thoughts to more helpful ones. Within this framework, judgmental or avoidant responses to thoughts and feelings would be classified as "red" thoughts, and therefore, it is possible that the CAMM has detected a change in awareness of "red" thoughts for FRIENDS participants. It is also possible that within the FRIENDS program, through reduction of rumination or worry associated with internalizing difficulties, children became more aware of their external surroundings (the awareness of ongoing activity). Within the literature, concerns have been raised regarding the ability of self-report methods of measuring mindfulness in children, as it is an internal process that lacks an external referent upon which to validate measures (Pallozzi et al., 2017). It is generally understood that the structure of mindfulness in children is likely to be different to adults, given developmental differences. However, the exact structure and components have not yet been settled upon (Pallozzi et al., 2017). Results of our study suggest that further exploration may be required, as our results suggest that the CAMM may be tapping into a construct that is not unique to mindfulness practice.

The finding that attention improved for both programs is consistent with previous findings that improvements in mental health and attention are linked (Muris & Field, 2008). What is unique in this study is the use of both self-report and objective methods compared to an active control condition, with a similar pattern of results across the measures. The addition of objective tests to a self-report measure is important, as it is understood that the two methods may tap into different constructs, and children's perceptions of their attention abilities may not always be reflected by objective performance (Muris, Mayer, et al., 2008). Also, most studies within the MBI literature

have used self-report or third-person report methods (Black, 2015; Zenner et al., 2014). In the current study, effect sizes for children's self-report attention was slightly lower than their performance on the shifting attention test, but similar to the CPT-Domain score. There are few studies within the MBI literature to compare our results to, and to our knowledge, the effects for the attention measures used in this study at follow-up have not been previously established for an MBI. One previous RCT used an objective test of selective attention to compare an MBI to inactive control in a universal RCT with children in Grades 1-3 (*n*=194; Napoli et al., 2005). They found a moderate between-group difference at post-intervention, but follow-up data were not collected. A report of a non-randomized pilot study of children in Grades 2-3 found a significant improvement following participation in an MBI, for an objective measure of executive functioning (reaction time for a switching attention task), and this was sustained at 3-month follow-up, but effect sizes were not provided (Biegel & Brown, 2010). Cross-sectional data from the SAT and CPT's normative sample suggests that test performance increases with age, although the size of the effect by year of age is not specified (Gualtieri & Johnson, 2006a). Therefore, it is possible that children's cognitive development may have contributed to the large effect sizes over time. Given the early stage of this aspect of the literature, it is not possible to conclude confidently that maturation effects did not influence the results of this study, and future studies could aim to address this.

It is curious that the CPT-RT showed only small change for MBCT-C, and no change for FRIENDS, whereas the other attention variables had moderate to large effects. An explanation could be related to the task requirements of the test. The CPT is a fairly mundane 5-minute test, which requires a child to maintain their attention and not be distracted. The reaction time is for correct responses only, and minimal cognitive processing is required to identify the correct target: In the CPT, different letters appear on the computer screen for 1.5 seconds each, and when the target (the letter B) is present, the child is asked to press the space bar on the keyboard as quickly as possible. This can be compared to the SAT where the child is required to: note (at the top of the screen) the

instruction to match the sample stimulus' shape or colour; decide which of two stimuli at the bottom of the screen is the correct match to the sample stimulus and instruction; press a keyboard key with either their left or right index finger to select the correct target; all within two seconds. Therefore, for the CPT, given that the reaction time is only for correct responses, and once the correct target has been identified little cognitive processing is required, it is perhaps unsurprising that only small improvements were seen on this sub-scale.

Strengths of this study include the rigorous evaluation of mental health strengths and difficulties, and attention, comparison to an active control condition, and follow-up at both 3-month and 6-month time points. Conducting the RCT in schools meant that "real life" conditions were present, rather than a tightly controlled clinical trial. Therefore, effect sizes are likely to be generalizable to other primary school settings for similar populations. One potential limitation is the lack of an inactive control condition, particularly given that maturation effects for the objective attention tests have not been published. However, this is unlikely to be a limitation for anxiety, given the extensive available research for the FRIENDS program showing effects for anxiety compared to inactive controls to be small at post-intervention, and maintained throughout follow-up (Fisak et al., 2011; Higgins & O'Sullivan, 2015; Maggin & Johnson, 2014). A final limitation is that the loss of participants at the 6-month follow-up was greater than the 5% assumed within the power calculations. It is possible that this means that small differences between programs may not have reached statistical significance in this analysis, although use of imputation of missing cases in multi-level mixed models helped to overcome this.

Overall, this study provides new follow-up RCT data for MBCT-C compared to a well-established CBT program. It provides a unique contribution to both the MBI literature more broadly, and preventive interventions for "at-risk" children literature. MBCT-C was effective in improving mental health strengths and difficulties, and attention. However, there were no statistically significant differences between MBCT-C

and CBT at 6-month follow-up, and within-group effect sizes at 6-months compared to baseline were similar for each program. The results also suggest that the CAMM may not measure a psychological construct that is unique to mindfulness. Results of this study suggest that schools may select either program as a small-group preventive intervention for children experiencing internalizing difficulties, and could do so based on preference or availability of trained facilitators. Future studies could explore whether population sub-groups respond differently to the two programs, whether effects are sustained over the longer term, what the unique mechanisms of change are for MBCT-C, and continue to evaluate the most effective method of measuring mindfulness in children.

Supplement 1

Table S.1

Content of Booster Sessions

Program	Booster 1	Booster 2
MBCT-C	Begin the session/welcome	Begin the session/welcome
	Being Present board/Feely Faces scale	Being Present board/Feely Faces scale
	Review agenda	Review agenda
	Three-Minute Breathing Space	Three-Minute Breathing Space
	Mindfulness practices:	Mindfulness practices:
	Exploring Everyday Mindfulness	Exploring Everyday Mindfulness
	Mindful Eating	Mindful Listening
	Mindfulness of the Body	Mindfully Walking – Fast and Slow
	Practising Mindfulness in Every Day Life	Practising Mindfulness in Every Day Life
	Conclude the session:	Conclude the session:
	Three-Minute Breathing Space	Three-Minute Breathing Space
	Reading the poem	Reading the poem
	Feely Faces Scale	Feely Faces Scale
	Review Handouts	Review Handouts
FRIENDS	Establish agenda	Establish agenda
	Warm-up activity	Warm-up activity
	Review Session 10 and Family Activities	Review Booster Session 1 and Family Activities
		Skills Review
	Activity 1: Time to Think About Giving Back!	Activity 1: Preparing for Future Challenges
	Activity 2: My Life Lately	Activity 3: Using the FRIENDS Skills to Help Others and Ourselves
	Activity 3: FRIENDS Update	
	Warm-down	Warm-down
	Family Activities	Family Activities

Table S.2

Cronbach's α Coefficients by Follow-up Time Point

Measure	3-months (*n*=80)	6-months (*n*=80)
RCADS-A	0.87	0.89
RCADS-D	0.88	0.88
CAMM	0.77	0.75
ACS	0.88	0.92
CYRM-12	0.90	0.93
PQOL	0.94	0.95
SDQ Total Difficulties		
Child	0.85	0.86
Teacher	0.86	0.84
Parent	0.80	0.86
SDQ Prosocial		
Child	0.72	0.72
Teacher	0.81	0.80
Parent	0.65	0.76

Note: RCADS=Revised Child Anxiety and Depression scale; CAMM=Child and Adolescent Mindfulness Measure; ACS=Attention Control Scale; CYRM-12=Child and Youth Resilience Measure; PQOL=Pediatric Quality of Life Scale; SDQ=Strengths and Difficulties Questionnaire.

CHAPTER 5. CONCLUSION

5.1 Overview

The overall aims of this research were to determine whether MBCT-C could be successfully implemented as a preventive program for mental health difficulties, with Australian primary school children aged 9-12 years, and to explore attention as a possible mechanism of change. The research aims were achieved through three sequential studies. A pilot study assessed feasibility and acceptability (Chapter 2); an RCT examined effectiveness of MBCT-C compared to an established CBT program from pre- to post-intervention (Chapter 3); and 3- and 6-month follow-up data were also collected (Chapter 4). Overall, the three studies have demonstrated that MBCT-C is feasible, acceptable, and effective, when implemented as a preventive program for children displaying signs of internalizing difficulties, and is as effective as CBT. The results suggest that changes in mindfulness and attention (as measured in this study) were not unique to MBCT-C, as similar effects were seen for CBT. This chapter summarises the key findings of each study, the theoretical and practical implications, strengths and limitations of the methodology, and future research direction that could flow from the findings.

5.2 Review of Thesis Findings

5.2.1 Study 1 – Pilot Test

The pilot study was conducted with children (n=26) from primary schools (n=2). The main aim was to assess feasibility and acceptability of implementation of MBCT-C, and a secondary aim was to explore whether it improved mental health strengths and difficulties. These aims were achieved through a mixed methods evaluation, with qualitative thematic analysis being the dominant methodology, supplemented by pre- to post-intervention quantitative measures of mental health strengths, difficulties, mindfulness, and attention. An 11-session program was implemented over 9 weeks. Qualitative and quantitative data were provided by the children, their parents, teachers, and school principals. Overall, the program was found to be feasible to implement, although holding two sessions in some weeks was thought to rush the program a little too

much. This was based on facilitators' perceptions that children needed longer between sessions, to allow concepts to settle, and home practice to take effect. MBCT-C was also found to be acceptable, and although there were differences in children's likes and dislikes of particular activities, there were none that were universally rejected, and none that caused serious adverse effects for the children. The qualitative and quantitative data converged in finding that participating in MBCT-C had helped the children to reduce their emotional difficulties. For a small number of children, each of whom had a complex personal history, this change was described as "transformational". Mindful breathing was found to be a common factor in children's descriptions of what they found helpful in MBCT-C, and those who engaged with the breathing practices were those who reported benefits from participation. The finding that attention may improve through MBCT-C was also encouraging. This was a determined by the qualitative analysis, and the self-report and objective attention measures. Attention is considered to be a key component of change in MBCT-C, and a key component of mindfulness theory. This initial finding provided a strong rationale to test attention as a mediator of change in the RCT.

The pilot test also provided the opportunity to consider implementation with a group of children experiencing externalizing difficulties. Three of the four boys who were enrolled at baseline withdrew within the first 2-3 sessions. Although the research team had concerns that this was due to the program content, advice from school staff indicated that this was unlikely to be the case, as all four boys had completed informal meditation exercises (albeit not mindfulness meditation) with a classroom teacher in the previous school year. Furthermore, the fourth boy completed the program on his own, and made significant emotional and behavioural improvements in that time, which were sustained throughout the following months. It was thought that children with externalizing difficulties may need a greater level of support to complete the program than what is provided in the small-group format currently specified in the MBCT-C protocol. For example, if their school teacher was to participate alongside them, it would

provide a strong role model, and opportunity for the teacher to implement mindfulness practices between sessions.

A number of practical recommendations flowed from this pilot test. Parents and teachers wished to know more about what was happening during the program. However, this was with a strong caveat that life is already very busy, and they preferred not to be overloaded with information. A second recommendation was to restructure the program, to better fit with the Australian school term (9-10 weeks), and avoid holding two sessions in one week. A third recommendation was to consider booster sessions following completion of the main program, as is offered in adult MBCT, and in other children's social and emotional learning programs.

5.2.2 Study 2 – Randomised Controlled Trial

The RCT was conducted with children aged 9-12 years (*n*=89) in primary schools (*n*=3). The overall aim was to examine the effectiveness of MBCT-C as a preventive intervention for internalizing difficulties. A well-established CBT program was selected as an active control condition. The primary objective was to establish whether MBCT-C would be superior to CBT, for measures including mental health difficulties and strengths, mindfulness, and attention. The second objective was to explore whether attention is a plausible mediator of changes in mindfulness scores from pre- to post-intervention for MBCT-C compared to CBT. The pre- to post-intervention effects were analysed using hierarchical multi-level mixed models, controlling for school, gender, age, and number of sessions attended. For the mediation analysis, due to resource constraints it was not possible to create a temporal delay between measurement of attention, and post-intervention mindfulness, thus the analysis and results are considered a preliminary exploration. Fidelity was measured and reported including attendance; adherence to program material protocols; and facilitator's perceptions of children's reaction to the program content, and levels of home practice. Multi-respondent data was provided by the Strengths and Difficulties Questionnaire parent, teacher, and child forms (SDQ; parent, teacher, and child forms). Objective and self-report measures

of attention were selected based on their fit with a theory describing components of mindfulness. It was also considered important to use both self-report and objective attention measures because of a finding that they each may tap into different psychological constructs, and therefore relate differently to outcomes such as reductions in symptoms of psychopathology (Muris, Mayer, et al., 2008; Muris, van der Pennen, et al., 2008).

Results found that MBCT-C was effective in improving symptoms of depression and anxiety, resilience, self-report and shifting attention, although no more so than CBT. The small effect sizes were consistent with meta-analytic findings for CBT programs implemented in similar populations (Fisak et al., 2011; Maggin & Johnson, 2014). The small reduction in anxiety and depression symptoms is an improvement on previous studies of MBCT-C, which did not detect any change (Lee et al., 2008; Semple et al., 2010). It may be that the use of measures suitable for sub-clinical populations in the current study was the reason for this difference, as previous studies used clinical measures in a similar population (which may have impeded the ability of the measures to detect change).

The findings of no between-group differences for mindfulness and attention, and no indirect effect between program, attention and mindfulness (within the preliminary mediation analyses), was surprising given that attention and mindfulness are core components of MBCT-C but not CBT. Other studies of MBIs in similar populations have failed to detect within-group changes in mindfulness using the Child and Adolescent Mindfulness Measures (CAMM; Ames et al., 2014; Johnson et al., 2016), and there are known difficulties with measurement of mindfulness in children which may have impeded the ability of the CAMM to detect change (Pallozzi et al., 2017). The results for attention variables in this study question the theory that attention is a unique mechanism of change for mindfulness. Given that attention is considered to be multifaceted, it is possible that a measure or component of attention not measured in this study would have shown different effects. However, in this study the combination of self-report and

objective attention measures, and preliminary mediation analyses, provides a useful contribution towards answering the questions raised in the literature about mechanisms of change in children's mindfulness programs.

5.2.3 Study 3 – Follow-Up Data for the Randomised Controlled Trial

The aim of the final study was to provide 3- and 6-month follow-up data for the RCT, including implementation of two booster sessions per program. The primary aim was to explore whether MBCT-C would have stronger effects than CBT during the follow-up period, and when compared to baseline. Contrary to the hypotheses, there was only one between-group difference at 3-month follow-up, and no between-group differences at 6-month follow-up. Within group effect sizes at 6-months compared to baseline were similar for each program, and indicated that where change was seen from pre- to post-intervention, it grew in effect over the follow-up period. These effect sizes were: large to very large for shifting attention; large for anxiety and depression; moderate to large for attention control; moderate for quality of life, teacher and parent SDQ Total Difficulties, and CPT-Domain; small to moderate for the CAMM; and little to no effect for the CPT, SDQ Prosocial sub-scales, and children's SDQ Total Difficulties. These results were an improvement on meta-analytic within-group effect sizes calculated for CBT programs used to prevent anxiety and depression in at-risk children (Rasing et al., 2017). Taken together, these results provide further evidence that MBCT-C can be implemented as a preventive intervention in primary schools, for children with internalizing difficulties.

5.3 Implications

There are several theoretical and practical implications of this research, which are likely to be of interest to researchers, practitioners, and school staff. Theoretical implications will be discussed first, followed by practical implications. The pilot study provided an opportunity to explore the application of the Buddhist Psychological Model (BPM; Grabovac et al., 2011), and the results partially support this model. The qualitative data suggested that children grew in awareness of their mental processes and

bodily sensations (stage 1), and learnt to understand that their internal experience (such as a particular thought) could influence their perception of an external event. Furthermore, both the qualitative data, and improvement in the self-report attention control, suggest that they were also able to use attention regulation to disengage with habitual responses (stage 2). Whether children were able to reach stage 3 (development of insight) is less certain. Within the qualitative data, particularly the "changes within the children" theme, it was clear that children developed an understanding that thoughts and feelings are transient, and need not be habitually reacted to. One child was also able to articulate a sophisticated explanation of the impermanence of thoughts and feelings, and being able to let them come and go. However, the BPM also states that a reduction in emotional distress may also occur on a short-term basis, as a result of using attention regulation to switch attention away from maladaptive thought processes. From the pilot study data, it is difficult to determine whether it was attention regulation, or true insight, that led to the reduction in children's emotional difficulties. Furthermore, it is likely to be difficult to measure insight in children of this age, due to natural limits in their cognitive and language capabilities.

Within common definitions of mindfulness, attention is one of three central components, along with attitude and intention (Burke, 2010). Attention in this definition includes focussed, sustained, and switching attention, along with self-regulation of attention. Within the RCT, it was possible to explore whether measures of sustained, switching, and self-regulation of attention would support this theory. Improvements in self-report attention control (self-regulation of attention), switching attention, sustained attention, and mindfulness were seen from pre- to post-intervention, and effect sizes strengthened during the follow-up period, but there were no differences detected between MBCT-C and CBT. Furthermore, preliminary mediation analyses failed to find a unique indirect effect for the relationship between program, attention, and post-intervention mindfulness. These results could be considered a failure to support the hypothesis that switching attention, and attention control, are truly unique components of mindfulness,

and that attention is a unique component of change for MBIs (Zoogman et al., 2015). However, there are several factors to consider when interpreting the results. As discussed in Study 2, the preliminary mediation analysis did not provide temporal delay between measurement of attention and post-intervention mindfulness. Furthermore, the very small effect size for the CAMM from pre- to post-intervention may have impeded the ability of the indirect effect to reach statistical significance for measures other than the shifting attention test reaction time (which had a moderate between-groups difference). Another consideration is that it is known that objective measures of attention, even if aiming to measure the same construct (such as sustained attention), may tap into slightly different aspects of attention, and/or may have different information processing requirements (M. B. Shapiro et al., 1998). Therefore, it is still possible that alternative measures of shifting or sustained attention may have produced different results. Overall however, it is clear that the attention variables measured in this study changed to a similar extent for MBCT-C and CBT, and these results are likely to be of interest to researchers in planning future studies.

The lack of a between-group difference in mindfulness scores for both programs may be due to the reported difficulties with measuring mindfulness in children (Burke, 2010; Pallozzi et al., 2017). The results of this study add support to the argument that further research is required to understand the factor structure and best method of measuring mindfulness. However, as argued within Chapter 4, the CAMM's single factor reflects an awareness of ongoing activity, and awareness of judgmental/avoidant responses to thoughts and feelings (Greco et al., 2011). Within the FRIENDS program, children are taught to be aware of red (unhelpful) and green (helpful) thoughts, and if they were better able to identify judgmental thoughts as "unhelpful" after participation, this may have improved their CAMM score at post-intervention and follow-up. Also, it is possible that if participation in FRIENDS led to reduced worry and/or rumination, children may have naturally become more aware of ongoing activity, and this may also have improved their CAMM scores. Overall, the lack of between-group differences

suggest that the CAMM may be tapping into a construct that is not unique to mindfulness.

At the outset of this research, MBCT-C was hypothesized to outperform CBT, based on the theory that the cognitive processing required for CBT may be beyond the developmental capacity of younger children. The data from the current study do not support this hypothesis, as within-group effect sizes were similar for both programs, and were large for anxiety and depressive symptoms at 6-months post-intervention. Given that MBIs and CBT are taught in such different styles, it is interesting that they each produced similar results. Within learning and teaching theories it is proposed that in addition to differences in cognitive development, children may also differ in their ability to learn based on age, gender, cognitive style, verbal ability, personality, and/or other individual factors (Furnham, 2012; Riding, 2002). In future research it could be of interest to explore whether any of these factors predict whether a child responds more favourably to MBCT-C or CBT, particularly within the main 10-week intervention period where effect sizes were small. This could allow for more efficient targeting of programs to children's needs. However, the results also support other studies that have compared CBT to other forms of therapy with children and found no differences (James, James, Cowdrey, Soler, & Choke, 2015; Weisz, McCarty, & Valeri, 2006). It is also possible that (non-program-specific) benefits of a group-based intervention was the reason for success for both programs. This refers to factors such as improved awareness of emotions and thoughts, group cohesiveness and the forming of friendships, learning from peers (including normalisation of fears and worries), and the therapeutic alliance (Tucker & Oei, 2007).

In this research MBCT-C was reduced from 12 to 10 sessions, based on a need to more easily fit the program into one Australian school term, and a finding within the pilot study that implementing two sessions in one week was too much for the children involved. Although the change to the program's content were made in consultation with one of the program's authors, it is not possible to determine from the current results

whether the reduction in program length impacted effect sizes. Based on a finding that there is a strong positive relationship between number of minutes of mindfulness practice (including in-session and home practices) and strength of effect size (Zenner et al., 2014), it remains possible that the 12-week program may have a greater impact on outcome variables.

Overall, the results of this study suggest that MBCT-C may be implemented as a Tier 2 preventive intervention in Australian primary schools, for children displaying signs of internalizing difficulties. Given the equivalence of effect sizes between programs, schools could choose from either MBCT-C or CBT, based on preference, availability of trained facilitators, and/or other resources. Children could be selected by teachers and/or parents as displaying signs of high levels of worry or anxiety, appearing to be down all the time, being withdrawn, or generally very quiet, and could participate in MBCT-C or CBT in small groups within the school setting. Findings from the pilot study also suggest that teachers should be made aware that their support of children's attendance in a program like MBCT-C or CBT is an important source of role modelling.

5.4 Strengths and Limitations

In conducting the research in a "real life" setting, there were interruptions to sessions (such as another child entering the room during a mindfulness practice or CBT activity) that may have impacted on effect sizes, and it was difficult to fully control these. In the current study, the impact is considered to be low given that these interruptions impacted on a relatively small proportion of program content, and was balanced between programs. However, this remains an issue that needs to be carefully considered and controlled in future implementation.

Sending regular emails and handouts to parents and teachers went some way to address the concern that they didn't know what was being covered each week. Even with this additional communication however, home practice was relatively low, and engaging parents and teachers, and improving children's level of home practice was an ongoing challenge. Finding ways for facilitators and parents to be in regular communication could

assist with this. Another option may be the use of online or mobile phone applications to share practice material.

The facilitators in this research had varied experience with leading children's groups (and not all facilitators had prior experience). However, this is not considered a significant limitation of the current research, given that they each met the training recommendations and/or requirements for MBCT-C and FRIENDS. Furthermore, studies exploring therapist effectiveness did not find significant differences in effect sizes between trainee and qualified psychologists, in part due to high levels of training and clinical supervision for the trainee psychologists (Buckley, Newman, Kellett, & Beail, 2006; Goldberg et al., 2016).

In terms of measurement, a limitation of the current research relates to the concerns about measuring mindfulness, discussed above. The preliminary mediation analysis was also limited because a temporal delay was not implemented between the measurement of attention (the proposed mediator) and mindfulness (as discussed within the RCT). In addition, it should also be noted that two other theoretical components of mindfulness were not measured: attitude and intention, i.e. kindly non-judgmental attitude towards one's present moment experience, and an intention to simply observe what is present in the moment (rather than try to change anything, or achieve a goal of symptom reduction or relaxation). It is possible that these components are unique to mindfulness programs. Furthermore, it is also possible that the elements of attitude, intention, and attention, combine in a unique way within MBIs to improve outcomes. It would be of interest in future studies to measure this, as if they were found to be unique components, the studies could further investigate whether strengthening these elements (for example, through increased self-compassion practices) might improve effect sizes for MBIs. However, while non-judgmental acceptance is a factor in adult mindfulness measures such as the Freiburg Mindfulness Inventory (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006), Five Facet Mindfulness Questionnaire (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), and Cognitive and Affective Mindfulness Scale-

Revised (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2006), neither it, nor "intention" are currently contained within the two scales validated for children, the CAMM, or the Mindful Attention Awareness Scale for children and adolescents (Brown et al., 2011; Lawlor, Schonert-Reichl, Gadermann, & Zumbo, 2014). This further highlights the need for research to further examine the factor structure and measurement of mindfulness in children, to assist in understanding mechanisms of change, and to inform mindfulness theory.

Within the design phase of this research, consideration was given as to whether the RCT should include a waitlist (or other inactive) control group, in addition to the active control. Advice from a senior statistician within the University of Adelaide was that an inactive control condition was not necessary if there are known effects for an active control condition (T. Sullivan, personal communication, September 17, 2013). Adding a third condition to the study would have created participant recruitment challenges, and logistical and resource requirements that were beyond the scope of a PhD. Furthermore, implementing a waitlist control condition would have inhibited the ability of the study to conduct 3- and 6-month follow-ups for the entire participant pool. For these reasons, and given the known effects within the literature for the FRIENDS program when used as a preventive intervention, it was decided to progress without an inactive control condition. However, this did create a limitation in interpreting the effect sizes for the attention tests, which, to our knowledge, do not have previously published effect sizes for the FRIENDS program. Cross-sectional data from the objective attention measure's normative sample suggest that performance improves with age, although the size of the effect by year of age is not specified (Gualtieri & Johnson, 2006a). Therefore, it is not possible to conclude that the very large improvements for the shifting attention test, are not due to maturation or test practice effects across the 9-month period of this study.

Through conducting this research in a "real life' school setting rather than tightly controlled clinical setting, the results are more readily generalizable to other primary

school settings. Furthermore, the research fulfilled almost all of the recommendations for conducting research into mindfulness in schools (Felver et al., 2016), and this is a significant strength. This included testing an existing MBI (rather than creation of a new program); providing feasibility and acceptability data for a new setting and culture; comparing MBCT-C to an active control condition in a RCT; reporting of fidelity of implementation; use of multi-informant data; use of both self-report and objective attention measures; exploration of attention as a possible mechanism of change; and controlling statistically for differences between schools. The use of measures suitable for sub-clinical populations is likely to have improved the ability of the research to detect change in anxiety and depressive symptoms, compared to previous studies of MBCT-C where clinical measures were used (Lee et al., 2008; Semple et al., 2010). During the research design, care was taken to separate the role of researcher and practitioner, with the principal researcher (the current author) conducting all assessments, and other Masters level trainee psychologists implementing the programs. This was intended to minimise bias, e.g. to reduce the risk of socially desirable responding by children within measures and interviews.

5.5 Future Research Directions

There are several possible directions for future research. It would be of interest to further explore mechanisms of change for MBCT-C. This could include other components or measures of attention, and/or whether measures of attitude and intention differ between MBCT-C and CBT. Full (rather than preliminary) mediation analyses could be conducted, and/or exploration of different outcome variables (such as reduction in anxiety or depression). When considering key components of change, it may be of interest to introduce regular symptom measurement, to better understand “when” within the program the greatest change occurs. It would also be of interest to explore whether any specific factors predict whether a child is more likely to make greater gains through participation in MBCT-C or CBT, particularly during the pre- to post-intervention period. For example, research could explore whether there are differences in effects for

children of different levels of cognitive development, learning style, personality, or symptom severity. If this could be determined for the pre- to post-intervention period, it may improve effect sizes for one or both programs both in the short and longer term. It would also be of interest to understand whether the large within-group effects seen at 6-months follow up are sustained in the longer term, and whether any proportion of the large effects for the attention tests are due to maturation effects within children. A final measurement-related issue is a need for further exploration of the structure and best method of measuring mindfulness in children.

Another potential research avenue is implementing MBCT-C within clinical populations, i.e. children with diagnosed anxiety or depression. There is evidence from RCTs of MBIs in teenagers recruited from psychiatric outpatient clinics that the combination of an MBI plus treatment as usual (TAU) provided superior improvement in symptoms of mental illness, compared to TAU alone (Biegel et al., 2009; Tan & Martin, 2015). Given that the current study has now established that MBCT-C improves symptoms of anxiety and depression when used as a preventive intervention, future research could assess whether MBCT-C combined with TAU in younger children (aged 9-12) with diagnosed anxiety or depression, would improve outcomes.

At a practical level, it could be possible to compare different program lengths, to determine the most effective dosage (in terms of time-in session). For example, a 12-week program implemented over two school terms could be trialled and compared to the 10-week version. Finding ways to increase parent's involvement, and engage teachers, also has potential to encourage children's engagement and level of home practice.

Finally, it would be of interest to examine whether the results seen in the RCT and follow-up studies are replicated for CBT programs other than FRIENDS. Building a body of such evidence would be a requirement prior to a mindfulness program being recommended over and above CBT.

5.6 Final Comments

This research provides sequentially structured validation and effectiveness data for MBCT-C in a new setting and culture (Australian primary schools), and provides evidence that it may be implemented as a preventive program for children displaying symptoms of internalizing difficulties. A pilot study established feasibility and acceptability, and provided a rich description of what it was like to participate in MBCT-C. The two subsequent studies provide unique effectiveness data for a RCT of MBCT-C compared to CBT, including follow-up data up to 6-months post-intervention. The results help to answer questions in the literature for both MBIs, and preventive mental health programs, because both require RCTs such as the one conducted in this study (using an active control condition, with follow-up data beyond immediate post-intervention). The finding that changes in attention (as measured in this study) and mindfulness were not unique to MBCT-C compared to CBT, is likely to be of interest to researchers, and inform future studies exploring mechanisms of change. Overall, the findings suggest that schools may implement either MBCT-C or CBT as a Tier 2 preventive intervention, based on preference, resources, and/or availability of facilitators meeting training requirements.

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APPENDIX A.

MBCT-C Session Details (12-week Program)

Appendix A, Table 1

MBCT-C Session Details for 12-Week Program

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
1. Being on Automatic Pilot	• We live much of our life on automatic pilot. • Mindfulness exists, and it is a different, more helpful way of being in the world.	• Getting to Know You • Discovering Awareness in a Cup • What Mindfulness Means to Me • Taking Three Mindful Breaths	• Mindful Breathing Is the Best Practice • Mindfulness Is Cultivating Attention	• Mindful Breathing Lying Down • Mindful Breathing Sitting Up • Living with Awareness
2. Being Mindful Is Simple, but It Is Not Easy!	• Living with awareness isn't easy, so why are we doing this anyway? • We give attention to the barriers to practice. • Understanding the importance of practice. • Bringing awareness to the breath and body.	• Taking Three Mindful Breaths • Raisin Mindfulness • Mindfully Moooving Slowly • Taking Three Mindful Breaths	• Flight from the Shadow • Practicing Mindful Awareness • Instructions for Mindful Breathing	• Living with Awareness • Mindful Breathing • Mindful Eating

Table continues

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
3. Who Am I?	• Thoughts arise in the present, but are often about the past or future. • Thoughts may not be accurate to the present reality. • Thoughts are not facts.	• Taking Three Mindful Breaths • Mindfulness of the Body • Hey, I Have Thoughts, Feelings, and Body Sensations! • Listening to the Sounds of Silence • Taking Three Mindful Breaths	• Have You Ever Gotten a Thought? • Breathing • Who Am I?	• Mindful Breathing • Mindfulness of the Body • Pleasant Events
4. A Taste of Mindfulness	• We have thoughts, feelings, and body sensations, but these are not who we are. • Thoughts, feelings, and body sensations are not exactly the same as the events they describe.	• Introduction to Three-Minute Breathing Space • Opening to One Orange • Mindful Yoga Movements • Three-Minute Breathing Space	• Ode to a Grape • Three-Minute Breathing Space	• Three-Minute Breathing Space • Mindful Yoga Movements • Tasting Fruits

Table continues

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
5. Music to Our Ears	• Thoughts, feelings, and body sensations often colour how we experience the world. • With our thoughts, we create individual and unique relationships and experiences. • Awareness holds it all.	• Three-Minute Breathing Space • Do You Hear What I Hear? • Mindfulness of the Body • Three-Minute Breathing Space	• The Door	• Three-Minute Breathing Space • Mindfulness of the Body • Mindful Listening
6. Sound Expressions	• Practicing mindful awareness helps us recognize that thoughts, feelings, and body sensations influence how we express ourselves. • We can choose to express ourselves with mindful awareness.	• Three-Minute Breathing Space • Sounding Out Emotions-Mindfully • Mindful Yoga Movements • Three-Minute Breathing Space	• Hearing	• Three-Minute Breathing Space • Mindful Yoga Movements • Unpleasant Sounds

Table continues

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
8. Practice Looking	• Judging is not the same as noting. • If we simply observe experiences rather than judge them, the experience may change. • We can choose to observe or note our experiences instead of judge them.	• Three-Minute Breathing Space • Visualising with Clarity • Mindful Yoga Movements • Seeing What Is in the Mind's Eye • Three-Minute Breathing Space	• Looking	• Three-Minute Breathing Space • Seeing the Little Details • Stressful Events
8. Strengthening the Muscle of Attention	• Judging often changes how we experience the world. • Becoming more aware of judgments may change how we relate to thoughts and feelings. • Discovering "choice points".	• Three-Minute Breathing Space • Seeing Through Illusions • Moving Mindfully • Seeing What Is Not There • Three-Minute Breathing Space	• Choices	• Three-Minute Breathing Space- • Choosing to Be Aware • Seeing Five New Things

Table continues

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
9. Touching the World with Mindfulness	• We have little control over most events that occur. • We do have choices in how we respond to events. • Choice points only exist in the present moment. • Bringing greater awareness to this moment, we may see more choice points.	• Three-Minute Breathing Space • Being in Touch • Mindfulness of the Body • Three-Minute Breathing Space	• Touch	• Three-Minute Breathing Space • Mindfulness of the Body • Mindful Touching
10. What the Nose Knows	• We often react to events by moving toward things we like or judge as “good” and moving away from things we don’t like or judge as “bad”. • Judging an experience may interfere with seeing clearly what is present in each moment. • We have choices in how we respond to events.	• Three-Minute Breathing Space • Judging Stinks! • Mindful Yoga Movements • Three-Minute Breathing Space	• To Be or Not to Be • Things We Can Learn from a Dog	• Three-Minute Breathing Space • Mindful Yoga Movements • Mindful Smelling

Table continues

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
11. Life Is Not a Rehearsal	• Mindfulness is available in everyday life. • We can practice mindful awareness using all our senses.	• Three-Minute Breathing Space • Thoughts Are Not Facts • Feelings Are Not Facts Either • Raisin Mindfulness • Mindfulness Is... • Three-Minute Breathing Space	• Slow Dance • Letter To My Self	• Three-Minute Breathing Space • Letter To My Self
12. Living with Presence, Compassion, and Awareness	• Mindful awareness can be helpful in our daily lives. • Bringing greater awareness to our lives is a personal choice. • Living with awareness requires commitment, compassion, and continued daily practice.	• Three-Minute Breathing Space • Exploring Everyday Mindfulness • Program Evaluation (optional) • Three-Minute Breathing Space • Graduation Ceremony • Graduation Party! • Three-Minute Breathing Space	• Little Gidding • Living with Presence, Compassion, and Awareness • Letter from Therapist to Child • Daily Practice Calendar • Program Evaluation Questionnaire (optional)	

Appendix A, Table 1 continued

Session and Theme	Key Points	In-Session Practices	Poems, Stories, and Other Handouts	Home Practices
Three-Month Follow-Up	• Support for maintaining a daily practice of mindful awareness.	• No session • Therapist mails Letter to My Self and Daily Practice Calendar to each child	• Letter to My Self (written by the child after session 11) • Three-Month Follow-Up Letter from Therapist to Child • Daily Practice Calendar	

Note. Table is from *Mindfulness-Based Cognitive Therapy for Anxious Children* (pp. 79-83), by R. J. Semple and J. Lee, 2011, Oakland, CA: New Harbinger Publications. Copyright (2011) by Randye J. Semple and Jennifer Lee, New Harbinger Publications Inc. Reprinted with permission.

APPENDIX B.

Copies of Approvals for Pilot Test

THE UNIVERSITY of ADELAIDE

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

SABINE SCHREIBER
SECRETARY
HUMAN RESEARCH ETHICS COMMITTEE
THE UNIVERSITY OF ADELAIDE
SA 5005
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CRICOS Provider Number 00123M

15 February 2013

Dr R Roberts
School of Psychology

Dear Dr Roberts

PROJECT NO: H-2013-004
Mindfulness-Based Cognitive Therapy for children: Does training in mindfulness improve wellbeing?

I write to advise you that the Human Research Ethics Committee has approved the above project. Please refer to the enclosed endorsement sheet for further details and conditions that may be applicable to this approval. Ethics approval is granted for a period of three years subject to satisfactory annual progress reporting. Ethics approval may be extended subject to submission of a satisfactory ethics renewal report prior to expiry.

The ethics expiry date for this project is: 29 February 2016

Where possible, participants taking part in the study should be given a copy of the Information Sheet and the signed Consent Form to retain.

Please note that any changes to the project which might affect its continued ethical acceptability will invalidate the project's approval. In such cases an amended protocol must be submitted to the Committee for further approval. It is a condition of approval that you immediately report anything which might warrant review of ethical approval including (a) serious or unexpected adverse effects on participants (b) proposed changes in the protocol; and (c) unforeseen events that might affect continued ethical acceptability of the project. It is also a condition of approval that you inform the Committee, giving reasons, if the project is discontinued before the expected date of completion.

A reporting form for the annual progress report, project completion and ethics renewal report is available from the website at http://www.adelaide.edu.au/ethics/human/guidelines/reporting/

Yours sincerely

Dr John Semmler
Convenor
Human Research Ethics Committee

THE UNIVERSITY of ADELAIDE

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

SABINE SCHREIBER
SECRETARY
HUMAN RESEARCH ETHICS COMMITTEE
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email: sabine.schreiber@adelaide.edu.au
CRICOS Provider Number 00123M

Applicant: Dr R Roberts

School: Psychology

Project Title: ***Mindfulness-Based Cognitive Therapy for children: Does training in mindfulness improve wellbeing?***

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

Project No: **H-2013-004** RM No: 0000015704

APPROVED for the period until: **29 February 2016**

Subject to approval from the South Australian Department of Education and Child Development. Thank you for the response dated 13.2.13 to the matters raised by the Committee. It is noted that this study will involve Kathleen Wright PhD/Masters candidate.

Refer also to the accompanying letter setting out requirements applying to approval.

Dr John Semmler **Date:** 14.2.13
Convenor
Human Research Ethics Committee

Government of South Australia
Department for Education and Child Development

Policy and Communications

Level 8
31 Flinders Street
Adelaide SA 5000
GPO Box 1152
Adelaide SA 5001
DX 541

Tel: 8226 4108
Fax: 8226 1605

DECD CS/13/192.1

1 February 2013

Ms Kathleen Wright
The University of Adelaide
North Terrace Campus
Adelaide SA 5005

Dear Ms Wright

Your project titled "Mindfulness - Based Cognitive Therapy for Children: Does Training in Mindfulness Improve Wellbeing ?" has now been reviewed by a senior Department for Education and Child Development (DECD) consultant with respect to protection from harm, informed consent, confidentiality and suitability of arrangements. Accordingly, I am pleased to advise you that your project has been **approved.**

The DECD Reviewer of this project is Lee Duhring.

If you wish to clarify or discuss further please feel free to contact her on Ph: 8226 1359

Please contact Ms Allison Cook, Project Officer - Research and Innovation on (08) 8226 4108 for any other matters you may wish to discuss regarding the general review/approval process.

Please supply the department with an electronic copy of the final report which will be circulated to interested staff and then made available to DECD educators for future reference.

I wish you well with your project.

Ben Temperly
HEAD OF POLICY AND COMMUNICATIONS

Government of South Australia
Department for Education and Child Development

Policy and Communications

31 Flinders Street
Adelaide SA 5000
GPO Box 1152
Adelaide SA 5001
DX 541

Tel: 8226 4108
Fax: 8226 1605

DECD CS/13/192.1

Dear Principal/Director/Site Manager

The research project titled *"Mindfulness - Based Cognitive Therapy for Children: Does Training in Mindfulness Improve Wellbeing ?" has been reviewed* centrally and granted approval for access to Department for Education and Child Development (DECD) sites. However, the researcher will still need your agreement to proceed with this research at your site.

Once approval has been given at the local level, it is important to ensure that the researchers fulfil their responsibilities in obtaining informed consent as agreed, that individuals' confidentiality is preserved and that safety precautions are in place.

Researchers are encouraged to provide feedback to sites used in their research, and you may wish to make this one of the conditions for accessing your site. To ensure maximum benefit to DECD, researchers are also asked to supply the department with a copy of their final report which will be circulated to interested staff and educators for future reference.

Please contact Allison Cook, Project Officer – Research and Innovation on (08) 8226 4108 for further clarification if required, or to obtain a copy of the final report.

Yours sincerely

Ben Temperly
HEAD OF POLICY AND COMMUNICATIONS

APPENDIX C.

Copies of Approvals for the Randomized Controlled Trial

THE UNIVERSITY of ADELAIDE

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

SABINE SCHREIBER
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21 November 2013

Dr R Roberts
School of Psychology

Dear Dr Roberts

PROJECT NO: H-2013-084
Comparing mindfulness-based cognitive therapy for children (MBCT-C) to cognitive behavioural therapy (CBT): a randomised clinical trial of Australian school children

I write to advise you that the Human Research Ethics Committee has approved the above project. Please refer to the enclosed endorsement sheet for further details and conditions that may be applicable to this approval. Ethics approval is granted for a period of three years subject to satisfactory annual progress reporting. Ethics approval may be extended subject to submission of a satisfactory ethics renewal report prior to expiry.

The ethics expiry date for this project is: 30 November 2016

Where possible, participants taking part in the study should be given a copy of the Information Sheet and the signed Consent Form to retain.

Please note that any changes to the project which might affect its continued ethical acceptability will invalidate the project's approval. In such cases an amended protocol must be submitted to the Committee for further approval. It is a condition of approval that you immediately report anything which might warrant review of ethical approval including (a) serious or unexpected adverse effects on participants (b) proposed changes in the protocol; and (c) unforeseen events that might affect continued ethical acceptability of the project. It is also a condition of approval that you inform the Committee, giving reasons, if the project is discontinued before the expected date of completion.

A reporting form for the annual progress report, project completion and ethics renewal report is available from the website at http://www.adelaide.edu.au/ethics/human/guidelines/reporting/

Yours sincerely

per **Dr John Semmler**
Convenor
Human Research Ethics Committee

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

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CRICOS Provider Number 00123M

Applicant: Dr R Roberts

School: Psychology

Project Title: ***Comparing mindfulness-based cognitive therapy for children (MBCT-C) to cognitive behavioural therapy (CBT): a randomised clinical trial of Australian school children***

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

Project No: **H-2013-084** RM No: 0000017443

APPROVED for the period until: **30 November 2016**

Thank you for the response dated 19.11.13 to the matters raised by the Committee. It is noted that this study will be conducted by Kathleen Wright, PhD/Masters (Clinical) candidate.

Refer also to the accompanying letter setting out requirements applying to approval.

Dr John Semmler **Date:** 21 NOV 2013
Convenor
Human Research Ethics Committee

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

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2 April 2014

Dr R Roberts
Psychology

Dear Dr Roberts

PROJECT NO: H-2013-084
Comparing mindfulness-based cognitive therapy for children (MBCT-C) to cognitive behavioural therapy (CBT): a randomised clinical trial of Australian school children

Thank you for the email dated 21.3.14 from Kathleen Wright requesting amendment to the above project. I write to advise you that on behalf of the Human Research Ethics Committee I have approved the request to replace the Resiliency Scales for Children and Adolescents with two similar measures as detailed in the email and attachments.

The ethical endorsement for the project applies for the period until: 30 November 2016

Where possible, participants taking part in the study should be given a copy of the Information Sheet and the signed Consent Form to retain.

Please note that any changes to the project which might affect its continued ethical acceptability will invalidate the project's approval. In such cases an amended protocol must be submitted to the Committee for further approval. It is a condition of approval that you immediately report anything which might warrant review of ethical approval including (a) serious or unexpected adverse effects on participants (b) proposed changes in the protocol; and (c) unforeseen events that might affect continued ethical acceptability of the project. It is also a condition of approval that you inform the Committee, giving reasons, if the project is discontinued before the expected date of completion.

A reporting form is available from the Committee's website. This may be used to renew ethical approval or report on project status including completion.

Yours sincerely

Dr John Semmler
Convenor
Human Research Ethics Committee

Government of South Australia
Department for Education and Child Development

Strategy and Performance

Level 8
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DECD CS/13/193-2.7

14 October 2013

Ms Kathleen Wright
The University of Adelaide
North Terrace Campus
ADELAIDE S.A. 5005

Dear Ms Wright

Your project titled "Comparing Mindfulness-Based Cognitive Therapy for Children (MBCT-C) to cognitive Behavioural Therapy (CBT): A Radomised Clinical Tril of Australian School Childen" has now been reviewed by a senior Department for Education and Child Development (DECD) consultant with respect to protection from harm, informed consent, confidentiality and suitability of arrangements. Accordingly, I am pleased to advise you that your project has been **approved.**

The DECD Reviewer of this project is Graham Brown. If you wish to clarify or discuss further please feel free to contact her on Ph: 8204 1068.

Please contact Ms Allison Cook, Project Officer - Research and Innovation on (08) 8226 4108 for any other matters you may wish to discuss regarding the general review/approval process.

Please supply the department with an electronic copy of the final report which will be circulated to interested staff and then made available to DECD educators for future reference.

I wish you well with your project.

Ben Temperly
HEAD OF STRATEGY AND PERFORMANCE

Government of South Australia
Department for Education and Child Development

Strategy and Performance

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GPO Box 1152
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Tel: 8226 4108
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DECD CS/13/193-2.7

Dear Principal/Director/Site Manager

The research project titled *"Comparing Mindfulness-Based Cognitive Therapy for Children (MBCT-C) to cognitive Behavioural Therapy (CBT): A Radomised Clinical Tril of Australian School Childen" has been reviewed* centrally and granted approval for access to Department for Education and Child Development (DECD) sites. However, the researcher will still need your agreement to proceed with this research at your site.

Once approval has been given at the local level, it is important to ensure that the researchers fulfil their responsibilities in obtaining informed consent as agreed, that individuals' confidentiality is preserved and that safety precautions are in place.

Researchers are encouraged to provide feedback to sites used in their research, and you may wish to make this one of the conditions for accessing your site. To ensure maximum benefit to DECD, researchers are also asked to supply the department with a copy of their final report which will be circulated to interested staff and educators for future reference.

Please contact Allison Cook, Project Officer – Research and Innovation on (08) 8226 4108 for further clarification if required, or to obtain a copy of the final report.

Yours sincerely

Ben Temperly
HEAD OF STRATEGY AND PERFORMANCE

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Email: director@cesa.catholic.edu.au
www.cesa.catholic.edu.au

Ms Kathleen Wright
School of Psychology
University of Adelaide
Level 4, Hughes Bulding
ADELAIDE SA 5005

Dear Kathleen

Thank you for your email in which you seek permission to conduct research in Catholic schools into whether Mindfulness-Based Cognitive Therapy for Children (MBCT-C) reduces symptoms of mental illness in pre-adolescent Australian Children, to examine the mediators of change for MBCT-C and compare its efficacy to group-based Cognitive Behaviour Therapy. I understand this research will involve testing of participating children both pre- and post-intervention following information meetings with the parents and student involved.

I also understand express parental permission will be obtained before any children are identified by name to the researcher, except in general terms, such as gender, age and area of difficulty.

In the normal course, permission of the Principal of each school in which you wish to conduct research is required. Research in Catholic schools is granted on the basis that individual students, schools and the Catholic sector itself is not specifically identified in published research data and conclusions.

Approval is also contingent upon the following conditions, i.e. that:

- a copy of any questionnaires have been provided to the Principal
- the permission of parents and teachers has been obtained
- the research complies with the ethics proposal of the University of Adelaide
- the research complies with any provisions under the Privacy Act that may require adherence by you as researcher in gathering and reporting data
- no comparison between schooling sectors is made
- the researcher will be carrying out the research within view of the class teacher or authorised school observer
- sector requirements relating to child protection and police checks are met by researchers:
    - where researchers obtain information in relation to a student which suggests or indicates abuse, this information must be immediately conveyed to the Director of Catholic Education SA

- all researchers and assistants, who in the course of the research interact in any way with students, are required to provide evidence of an acceptable police clearance direct to the school.

Further information can be obtained direct from the Police Check Unit (08) 8210 9383 or via receptionpcu@adelaide.catholic.org.au.

Please accept my very best wishes for the research process.

Yours sincerely

HELEN O'BRIEN
DEPUTY DIRECTOR

14 March 2014